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1 **A case study of the use of verbal reports for talent identification**
2 **purposes in soccer: A *Messi* affair!**

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16 **A case study of the use of verbal reports for talent identification**
17 **purposes in soccer: A *Messi* affair!**

18 **Abstract**

19 Using a two-study approach, the main purpose of this case study was to explore
20 the use of a verbal reporting methodology to better understand the thought
21 processes of soccer talent scouts during an in-situ talent identification
22 environment. Study 1 developed a standardized coding-scheme to examine verbal
23 cognitions during a single soccer game. Study 2 then utilized this methodology to
24 examine two full-time recruitment staff trained in the use of concurrent verbal
25 reporting before undertaking a live, in-game task. Participants also participated in
26 a debrief interview following the game. The findings of the two studies suggest
27 that developing a verbal reporting protocol is viable, however when applied in a
28 live-game environment it is problematic. Future research should therefore
29 consider a modified version of this task to further explore the cognitions of scouts
30 whilst observing and identifying potential talent.

31

32 **Keywords:** Scouting, recruitment, football, cognition

33 **Introduction**

34 In professional sports such as soccer, heads of player recruitment and coaches
35 are constantly striving for the most effective methods of identifying and developing
36 potentially talented youth players [1]. Given the performance advantage a professional
37 soccer organisation can gain over other teams by ‘scouting’ the most talented young
38 players and coupled with the considerable financial rewards potentially on offer, the
39 value of an effective scouting system is evident [2]. From a business perspective,
40 individual players become a valuable human resource [3], which in turn, places
41 considerable importance on the network of talent scouts and recruitment staff who
42 perform the role of identifying and recruiting talented youth players into professional
43 academies. A recent systematic review [4] of talent identification and development in
44 male football identified four broad areas of research interest: 1) task constraints; 2)
45 performer constraints; 3) environmental constraints; and 4) multidimensional analysis.
46 This review, however, identified that there is a larger predisposition for studying
47 developmental aspects of performance, as opposed to identification processes; possibly
48 due to the inherent difficulties associated with identification, especially at younger ages
49 [5]. This is, perhaps, further compounded by the lack of a consensus that defines talent
50 [6, 7, 8].

51 Researchers interested in talent identification in junior-elite soccer have grappled for
52 many years to develop adequate and objective assessments of talent identification
53 processes in naturalistic and laboratory-based settings [9]. This study, therefore, acts a
54 pragmatic, first step in considering whether a naturalistic approach is feasible and/or
55 appropriate for talent identification purposes. We adopted an exploratory case study
56 design and suggest that results should be treated with appropriate caution given the
57 design utilised.

58 **Applied Talent Identification Process**

59 Despite the reported methodological constraints synonymous with talent identification
60 research (see [9] for a full review), and as others have already testified [10],
61 identification and selection is a necessary process on a long and winding road to elite
62 performance [11]. Talent scouts act as the on-the-ground face of the clubs that they
63 represent; they are the individuals who often make first contact with potentially talented
64 players. Whilst their primary function is to identify players and pass on information to
65 full-time recruitment staff, they regularly continue to communicate with players and
66 their family during and after a trial period with the club may have taken place [12].
67 Talent scouts, therefore, play an important role in the decision-making process
68 regarding the players that are recruited to a club; they observe, capture data, and employ
69 subjective judgements based on on-field actions [13].

70 Despite advancements in technology and the innovation of new multimedia platforms,
71 the ability for academies to collect, collate, and manage data on grassroots junior soccer
72 players is restricted. In most instances, academies collate a range of opinion-based
73 qualitative and quantitative data on individual players that is loosely positioned around
74 the clubs' recruitment and playing philosophy [14, 15]. Observations are usually, but
75 not always, repeated a number of times before a decision is made about whether or not
76 to recruit a player [12, 14, 15]. Evidence from England, however, suggest that
77 academies are not good at determining or, more precisely, explaining what attributes
78 they are observing when they are trying to identify talented youngsters [14, 15]; a
79 suggestion that is echoed in talent identification and development work elsewhere [5,
80 16].

81 Those who undertake scouting roles are, typically, individuals who have spent some
82 considerable time either playing or coaching soccer [15]. However, unlike coaches,

83 talent scouts are not required to possess any formal qualification to undertake the work
84 that they do [17]. The Premier League [17] outlines their recommended qualifications
85 for a range of staff, including coaching and medical, though there is variation between
86 clubs as to how this is operationalised [14]. Coaches working in an academy
87 environment require a range of qualifications. Formal soccer qualifications require
88 coaches to have achieved a defined level of competency in theoretical and practical
89 tasks, and assessments are specific to technical, tactical, strategic, organisational,
90 physiological, and psychological determinants of soccer coaching [18].
91 This state of affairs is not easily explained especially if one considers the fast-paced,
92 dynamic, and multidimensional nature of soccer. Combined with the speed of player
93 movements, the number of players involved and the subjective nature of visual
94 observations [10, 19], it becomes even less obvious why identification procedures have
95 not received further empirical ecological attention [20]. This ambivalence may be
96 explained by the equivocality surrounding notions of what *talent* [identification] means
97 [in sport] [11] and the confusion and contradictory language which permeates its way
98 through and across the talent development literature (see [21] for a review of
99 psychological terms). Approaching two decades from the publication of the Williams
100 and Reilly [22] model of talent predictors in soccer, talent identification and selection
101 processes continues to rely on apparent subjective (mis)judgements of talent scouts and
102 recruitment personnel.

103 As noted earlier, little is known about “*what*” talent scouts do, or more importantly
104 “*think*” when identifying and selecting players in either development, or performance
105 domains, during both competition and/or practice in *real time*. Previous soccer talent
106 identification studies using qualitative interview techniques have argued “that coaches
107 regard a player’s speed, play intelligence and attitude toward training and learning the

108 game as criteria they look for when identifying talent” [23]. Whereas others have
109 suggested that the most talented youth soccer players (*i.e.* 15-16 years) possess speed,
110 ball control, and an overall desire to succeed [24].
111 This rather obtuse position is in contrast to a body of well-established research
112 surrounding *talent development* where the influence of the environment in developing
113 the player is considered vital [25]. In support of this Mills and colleagues [26] reported
114 how ten expert development coaches considered discrete psychological factors such as
115 awareness, resilience, goal directed attributes, intelligence, sport-specific attributes, and
116 the environment as fundamental if players were to progress to the professional level. To
117 date, however, there has been little interest in recruitment staff as a participant group for
118 talent identification research, many previous studies have, as already mentioned, tended
119 to utilise coaches [27, 28] despite coaches, arguably, having greater responsibility for
120 player development than identification [12, 14]. Those studies that have included
121 recruitment staff as participants have, so far, used semi-structured interview techniques
122 to elicit the factors affecting the talent identification process from a structural,
123 organisational [12, 14] and philosophical perspective [29].
124 A potentially useful methodology for addressing this current gap in the talent literature
125 is verbal reports [30]. Since its development by Ericson and Simon [31] (see [32] the
126 use of verbal reports as a technique to elicit the verbalisation of thoughts while
127 performing a task has been widely deployed amongst skilled athletes in exercise settings
128 [33]. Grounded in positivist and empiricist epistemological assumptions, these studies
129 have typically included the use of closed skills from individual sports. For example, in
130 their study of adolescent high-performance golfers, Nicholls and Polman [34] sought to
131 understand acute stress and coping during golf putting performance. Their study
132 demonstrated the appropriateness of concurrent verbal reporting protocols during skill

133 performance to understand how athletes dealt with stress and developed strategies for
134 coping during performance. More recently, Samson *et al.* [35] adopted concurrent
135 verbal reporting for use with distance runners. This study identified how concurrent
136 verbal reporting was appropriate for use during long-distance running and highlighted
137 how data might be used to inform applied psychology support for endurance runners.
138 For example, data suggested all participants found the start of their run difficult, this
139 might highlight a need for sport psychologists to help runners adopt strategies (*e.g.* self-
140 talk) that help them overcome the difficulty associated with the early miles of a run. In
141 both studies [34, 35] there was a high level of ecological validity, and athletes were able
142 to verbalise their cognitions appropriately during performance. Despite an abundance of
143 empirical literature originating from the talent in sport domain, a key omission is
144 evidence surrounding “*what*” information talent scouts gather when deployed on
145 scouting assignments or, indeed, evidence of their actual “thoughts”.

146 The aim of this study, therefore, is to present a methodology for depicting concurrent
147 cognitions of talent scouts during part of the talent identification process (*i.e.* observing
148 a live game) by means of a verbal reporting protocol. Specifically, it is our intention to
149 consider the feasibility of establishing a standardized reporting protocol for talent
150 identification purposes. Study 1 develops a rigorous coding scheme and player-
151 positional attributes for examining verbal report data. Study 2 utilises the methodology
152 developed in Study 1 to compare the concurrent verbal cognitions of two talent scouts
153 undertaking a “live” talent identification assignment of two junior-elite soccer sides
154 playing against each other.

155 **STUDY 1**

156 **Methods**

157 **Study design and participants**

158 An exploratory case study design was utilised for this study, that allowed the
159 research team adequate flexibility given the multidisciplinary nature of the inquiry [36].
160 One main advantage of true case study design is its allowance for collaboration between
161 the researcher and participants [37]. The development of our codebook and coding
162 definitions followed a series of systematic and sequential stages. First, a list of specific
163 player attributes identified from a previous talent identification project published and
164 archived elsewhere (*i.e.* [38]) was incorporated into a video-based, simulated training
165 and analysis tool. The player attribute categories (*i.e.* psychological, technical, physical,
166 and hidden) were subject to content validation by a panel of full-time academy coaches
167 and recruitment staff (n=3) who were enrolled on an institutional postgraduate degree
168 programme [39]. Panel members ranged in age from 22 to 28 years (M = 25 years; SD =
169 3).
170 A 48-match sample of in-game footage of Nike Academy¹ (16-20-year-olds) matches
171 for the 2017 season was used during the study and identified examples of players
172 performing in a number of number of outfield positions (*i.e.* central defender, full-back,
173 central midfield, left/right midfield and central wide/attacking player). Full ethical
174 approval was provided by Liverpool John Moores University Ethics Committee

¹ The Nike Academy was an English football academy funded and administrated by Nike, Inc. until 2017. The academy had a revolving squad of unsigned under-20 players and was run with the intention of helping players find a professional football club. The academy was based at St Georges Park National Football Centre (UK) and the squad was made up of players scouted worldwide and drafted to the squad through the Nike Most Wanted football trials.

175 (15/EHC/044), and verbal and written informed consent was obtained from the
176 participants and the Nike Academy to use match recordings.

177 **Procedure for standardizing player-performance attributes**

178 In this study, we used a reliable and valid procedure to generate video clips of
179 the required attributes for all six outfield playing positions (central defender, fullback,
180 central midfielder, wide midfielder, centre-forward and wide attacker). The
181 standardization process followed the systematic review of 4320 minutes of match
182 footage in order to find video clips that were representative of various outfield
183 positions. All the agreed player film sequences were incorporated into SportsCode
184 Gamebreaker 10.3.1. for editing and reviewing purposes by members of the research
185 team. Training in the use of SportsCode Gamebreaker 10.3.1. was provided by one of
186 the authors (AM) (~3 hours training) who has extensive experience of performance
187 analysis education. In total (n=15) film sequences were produced for each of the
188 outfield positions (*i.e.* central defender, fullbacks, central midfielder, wide midfielder,
189 centre-forward and wide attacker). Each positional sequence contained (n=10) clips that
190 lasted for approximately 90 seconds each (15.00 minutes total).

191 **Validation of coding scheme**

192 To test for attribute acceptance for each position, we asked the participants to
193 watch the video clips and to concurrently verbalise their cognitions from when the video
194 clip started until it ended. Before the beginning of each clip, a black screen presented
195 the name of the playing position and a numbered countdown (3-2-1) was provided, to
196 aid participant visualisation [40]. In addition, a still image with a circle around the
197 player under observation was shown. To achieve acceptable content validity, the
198 observations were recorded and consensus as to whether the attributes were efficiently

199 shown in the player position-specific videos was determined. This approach
200 demonstrated the presence of these attributes and provided the likely language a scout
201 would adopt when thinking about the attribute. In order to confirm the existence of the
202 definitions within each category two members of the research team independently
203 reviewed the recordings and used the following equation to determine inter-observer
204 agreement (IOA): $[(\text{Agreements}) / (\text{Agreements} + \text{Disagreements})] \times 100$. For example,
205 if there was eight agreements and two disagreements then the equation would be $[(8) /$
206 $(8 + 2)] \times 100 = (8/10) \times 100 = 80\%$. In order to check for observer consistency, the
207 intra-observer reliability (IOR), was established by performing the same test, two weeks
208 after the initial data collection sufficient time for complete memory lapse.

209 **Results**

210 The results of this study found that the IOA for central defender was 0.87 (87%);
211 full back 0.80 (80%); central midfielder 0.84 (84%); left/right midfielder 0.80 (80%)
212 and central/wide attacking player 0.86 (86%). The results of the IOR for central
213 defender was 0.83 (83%); full back 0.81 (81%); central midfielder 0.83 (83%); left/right
214 midfielder 0.82 (82%) and central/wide attacking player 0.84 (84%).

215 **STUDY 2**

216 **Methods**

217 **Participants**

218 Following full ethical approval was provided by Liverpool John Moores University
219 Ethics Committee (15/EHC/044), two full-time talent scouts (*i.e.* Adam and Ben
220 [pseudonyms]) were purposively sampled from a category one English Premier League
221 academy (see [17], for an overview of academy category status). Adam (44 years) had

222 worked as a talent scout for (17 years) and Ben (26 years) had worked as a talent scout
223 for (3 years). Purposive sampling methods are commonly regarded as suitable for
224 studies where the research team are interested in capturing the best knowledge
225 concerning the research topic and studies which employ content analysis procedures
226 [39]. Prior to commencing the study both Adam and Ben provided written informed
227 consent and were notified that they could withdraw from the study at any time.
228 Gatekeeper consent to undertake video recording was obtained from the club's academy
229 director as well as the gatekeeper for the opposing team, subsequent informed consent
230 was also obtained from each individual player.

231 If we are to fully understand the role of the talent scout and their decision-making
232 processes it is important the complexities of the identification process are captured *in*
233 *situ* before attempting to recreate similar conditions in more controlled, simulated
234 environments [41]. The study was, therefore, conducted at the club's academy site as
235 the research team were granted permission by the club's academy director, to observe
236 and record a competitive game between the clubs under 15 team and another junior-elite
237 under 15 team. The game was played mid-week, kick off 1900 hours, on a regulation
238 size (100.5m x 64.0m) artificial 4G pitch, under floodlights with clear weather
239 conditions.

240 **Procedure**

241 Adam and Ben were trained in concurrent verbal reporting using an adapted
242 version of the instructions outlined by Ericsson and Kirk [42]. This included assigning
243 warm-up exercises such as mental calculations to shape their verbal behaviour. For
244 example, "So that you understand what I mean by think-aloud, let me give you an
245 example. Assume I asked you 'How much is 127 plus 35?'. Now think-aloud so I can
246 hear how you solve this problem. The participants practised providing verbal reports

247 with feedback provided by members of the research team until level I or II verbal
248 reports was established [43]. Training in concurrent verbal reporting techniques was
249 provided by a member of the research team who has published previously using this
250 procedure in both sport [44] and simulated medical domains [45]. All concurrent verbal
251 report training was conducted on the day of the game to ensure complete understanding
252 of the task requirements.

253 Prior to the game commencing, a Lavalier microphone and radio transmitter
254 (Sennheiser ew 122-p G3), was connected to a Dictaphone (Olympus WS-853) which
255 was fitted to both participants. Adam and Ben also wore GoPro camera's (GoPro Hero
256 5) which were attached to their chest in order to determine whether the team they were
257 scouting were in possession of the football or not. Adam and Ben were instructed to
258 verbalise their thought processes in real-time without self-censoring, or attempting to
259 justify or explain their thoughts, as per the verbal reporting protocol [31]. Each
260 participant took up a position at pitch level on opposite sides of the pitch on the half
261 way line (Figure 1) and engaged in a full 90-minute football game, with the typical 15-
262 minute half-time interval. During the game, Adam and Ben were allocated a research
263 assistant who stood behind them listening for verbal reporting occurring. If either
264 participant stayed quiet for longer than 30-seconds, following verbal reporting
265 protocols, they were prompted by the research assistant to "think aloud".

266 Fig 1: Image of the pitch from Adam's GoPro camera

267

268

! INSERT FIG 1 HERE !

269 ^aThis image has been edited to be black and white to avoid identification of the participating teams
270 through their kit colours.

271

272 For the first half of the game, Adam and Ben were asked to focus on the game as
273 a whole. This was intended to represent a scouting assignment where no particular
274 individual had been chosen for observation, and so the scout was responsible for
275 identifying those individuals who they believed to be talented. For the second half, the
276 research team selected two individuals from one team (the team with whom the scouts
277 were not associated) to focus their attention and provide verbal report data.
278 Following the game Adam and Ben engaged in a debrief and informal semi-structured
279 interview with members of the research team to discuss their thoughts on the verbal
280 reporting protocol, including any difficulties or concerns that they had. This was
281 recorded using a Dictaphone and transcribed away from the academy environment.

282 **Data Analysis**

283 **Verbal reports**

284 Verbal reports for both participants were transcribed verbatim, generating 15
285 single-spaced pages of text from 189 minutes and 20 seconds of total recorded audio.
286 Ericsson and Simon [43] outlined analysis procedures for verbal reporting protocols,
287 where they highlighted relevance, consistency, and patterns of verbalisation streams as
288 important. However, due to the exploratory nature of this study, and the broad range of
289 factors likely to be covered by scouts in a dynamic game environment, it was deemed
290 appropriate to conduct line-by-line deductive content analysis (see [46]). Deductive
291 content analysis is often exemplified by cases where researchers wish to code data
292 based on an existing categorisation matrix [46]. Any categorization matrix can be
293 regarded as valid if the categories adequately and accurately captures what was intended
294 [47].

295 **Table 1:** A detailed overview of the codebook

Variables	Coding	Example responses
Physical	(1) Acceleration	“Player looks quick, explosive change of pace”
	(2) Agility	“Nice turn, kept possession of the ball despite the defensive pressure”
	(3) Balance	“Looks comfortable on the ball, head up looks balanced”
	(4) Fitness	“Full back is up and down the pitch looks like he can run all day”
	(5) Speed	“Great response, the player really covered the ground didn’t think he/she would get back in time”
	(6) Stamina	“The player in midfield has covered some distance today”
	(7) Jumping reach	“Great leap, really got off the ground to attack the ball”
Psychological	(1) Aggression	“He/she is always putting pressure on the ball”
	(2) Anticipation	“Great play, spots the danger before the cross came over”
	(3) Bravery	“Put his/her body on the line then”
	(4) Composure	“Always looks calm and in control nothing seems to phase him/her”
	(5) Concentration	“Didn’t switch off was alert to the danger”
	(6) Decision-making	“2 v 1 good play – showed real game intelligence”
	(7) Determination	“Can he/she win it, yes well done, first to the ball he/she never gives up”
	(8) Leadership	“Good example by the player let’s see if the others respond”
	(9) Off-the-ball thinking	“Good movement by player, but not necessarily to receive the ball”
	(10) Positioning	“Taken up a great position to allow them to play out”
	(11) Team work	“He/she has put a real shift in for the team”
	(12) Attitude	“Showed a desire there to get back and help”
	(13) Vision	“He/she is scanning”
Technical	(1) First touch	“Poor touch”
	(2) Crossing	“Good delivery out wide into the danger area”
	(3) Corners (delivering)	“Great corner”
	(4) Dribbling/running with the ball	“Can he/she drive – good running with the ball”
	(5) Finishing	“An excellent finish at the near post” / “A poor finish from a good position”
	(6) Free-kicks	“That’s a great ball into a dangerous area”
	(7) Heading	“They’ve got up well, there”
	(8) Long-range shooting	“An excellent effort from distance, there”
	(9) Long-throw ins	“Need to be careful of his/her long throw in this position”
	(10) Passing accuracy	“Fantastic range and accuracy of passing”
	(11) Marking	“Don’t let him play it”
	(12) Penalty taking	“He/she has approached that calmly and sent the keeper the wrong way”
	(13) Tackling	“Luckily they’ve got that tackle timed perfectly”
	(14) 1 v 1	“If they can get the ball out wide they’ve got a 1 v 1”
	(15) Technique-under pressure	“Excellent turn to get out of a difficult position, there”
Hidden	(1) Adaptability	“The players have changed to his style of play”
	(2) Consistency	“His/her consistency is a great attribute”

	(3) Versatility	“He/she’s switched into the [alternative position] role seamlessly”
	(4) Important matches	“This is a game where he/she will shine”
	(5) Coachability	“They’re always listening to what the coach is saying, no matter what”
	(6) Communication	“Good talking between units”
	(7) Flair	“An amazing bit of skill to get away from the defender”
	(8) Creativity	“That’s a very clever decision”
Tone of statement	(1) Positive	“Great first-touch”
	(2) Negative	“Awful, there was no way that ball was ever going to reach the wide-player”
	(3) Neutral	“Can he/she play”
	(4) Unknown	“There is a lot more that’s not known at the moment”

297

298 Following transcription, verbal report data were converted to a Notepad text file
299 and imported into Microsoft Excel (2016). Each verbatim statement was then coded
300 using the coding criteria outlined in the codebook generated in Study 1. Each verbal
301 report was then simultaneously and independently coded by a second trained member of
302 the research team using the attribute definitions contained in the codebook. Each
303 concurrent statement was coded using a colour system which was aligned to the
304 attribute presented in Table 1. IOA estimates were conducted using the same method
305 noted above, and suggested that two coders had equivalently coded (70.3%) of the
306 verbalisations. The remaining verbalisations (29.7%) were re-coded by the two raters
307 following a line-by-line debrief and discussion. Following line-by-line deductive
308 content analysis, frequency counts of the individual phrases were imported into the
309 statistical package for the social sciences (SPSS V25) where descriptive statistical
310 analysis procedures were conducted (*i.e.* means and standard deviations).

311 **Informal debrief**

312 The informal debrief data were transcribed line-by-line and content analysis
313 with inductive reasoning was conducted to develop themes and a process of continual
314 examination and comparison was performed. Following hermeneutic procedures

315 provided by Thomas and Pollio [48], information-rich verbalisations were identified as
 316 meaning units, which were subsequently grouped into sub-themes. Verbalisations were
 317 pieces of coded text that related to an attribute and ranged in the number of words they
 318 contained. This process was initially completed by two (MJR & SR) of the research
 319 team before being shared with the remaining two team members (AM & CL) to
 320 consider trustworthiness surrounding interpretation of data.

321 **Results**

322 **Descriptive analysis – verbal reports**

323 The sample text references included a total of 11,696 words. There were 331
 324 psychological attribute verbalisations coded (M = 9.9 words, SD = 14.09); 316 were
 325 coded as technical attribute verbalisations (M = 22.57 words, SD = 30.36) and 56 were
 326 coded as physicality verbalisations (M = 8 words, SD = 5.54). The tone of
 327 verbalisations were mostly neutral (48%). Positive verbalisations were coded 27% of
 328 the time, with negative accounting for 17%, and unknown 8%. For a full breakdown of
 329 the findings please refer to Table 2.

330 Table 2: Descriptive Analysis of Verbalisations

		Frequency	Percent of attribute verbalisations	Percent of all verbalisations
Psychological attribute verbalisations	Anticipation	16	4.8	2.2
	Concentration	6	1.8	0.8
	Decision-making	158	47.7	21.7
	Determination	18	5.4	2.5
	Leadership	2	0.6	0.3
	Off-the-ball thinking	43	13.0	5.9
	Positioning	40	12.1	5.5
	Team work	2	0.6	0.3
	Attitude	38	11.5	5.2

	Vision	8	2.4	1.1
	TOTAL	331	100	45.5
Technical attribute verbalisations	First touch	73	23.1	10.0
	Crossing	26	8.2	3.6
	Corners (delivering)	2	0.6	0.3
	Dribbling/running with the ball	38	12.0	5.2
	Finishing	12	3.8	1.7
	Free-kicks (delivering)	2	0.6	0.3
	Heading	6	1.9	0.8
	Shooting	12	3.8	1.7
	Long-throw ins	10	3.2	1.4
	Passing accuracy	104	32.9	14.3
	Marking	4	1.3	0.6
	Tackling	6	1.9	0.8
	Technique under pressure	19	6.0	2.6
	Penalty taking	2	0.6	0.3
	TOTAL	316	100	43.5
Physical attribute verbalisations	Acceleration	2	3.6	0.3
	Agility	16	28.6	2.2
	Fitness	8	14.3	1.1
	Speed	12	21.4	1.7
	Stamina	4	7.1	0.6
	Strength	12	21.4	1.7
	Jumping reach	2	3.6	0.3
	TOTAL	56	100.0	7.7
Hidden attribute verbalisations	Communication	24	100	3.3
	TOTAL	24	100	3.3

331 **Psychological attribute verbalisations**

332 The highest frequency (n =158) of coded verbalisations related to *decision-*
333 *making* thoughts (47.7%). For example, in the first half of the game Adam stated: “*Look*
334 *to play, look to be positive good decision didn’t force it*” and “*Number four has it he’s a*
335 *threat, can he get on it in midfield, no wrong way – poor decision*”. The second most
336 prominent verbalisation was *off-the-ball thinking* (13%) followed by *positioning* (12.1%).
337 For example, in the first-half when the team Adam was scouting were not in possession
338 of the football he said, “*Got to see the danger on the weak side, he needs to drop in and*

339 *get in position – poor play he was ball watching.*” Adam and Ben also made a number of
340 comments (11.5%) which were coded as *attitude* verbalisations. For example, following
341 a mistake on the ball Adam commented “*Poor play a lack of quality maybe too quick,*
342 *now he needs to work hard and recover – good recovery there from the right back*”.

343 **Technical attribute verbalisations**

344 The participants mentioned a number of technical attributes during the game, but
345 the most prominent thoughts related to *passing accuracy* (32.9%), *first-touch* (23.1%)
346 and *dribbling/running with the ball* (12.0%). Typical positive examples from Ben
347 included “*Good pass from [blinded]. Good ball*”, a negative example “*Bad touch from*
348 *[blinded], should have done better*” and a neutral example included “*Can he travel, can*
349 *he travel. Can he go forward*”. Examples from Adam included “*Great ball, good delivery*
350 *well done*”, and “*Hold, hold, hold. Keep hold of it. Keep hold of it*” and “*Keep the ball,*
351 *attack him, good. Keep going forward, set up the cross.*”

352 **Physical attribute verbalisations**

353 The talent scouts mentioned 56 thoughts that related specifically to physical
354 attributes. The scouts commented positively on players agility (28.6%), speed (21.4%)
355 and strength (21.4%). For example, Ben stated, “*great turn and change of direction –*
356 *don’t stop drive, drive*” and “*That lad on the ball is quick – left side*” and “*Good*
357 *strength through the middle*”.

358

359 **Hidden attribute verbalisations**

360 The only hidden attribute that participants mentioned was communication
361 (100%). For example, Adam noted “*good talking from the skipper [team captain] there*”
362 and “*he’s spending a lot of time talking*”.

363

364 **Informal interview**

365 During the debrief with Adam and Ben, both indicated that the task was
366 ‘extremely difficult’, more so than they had imagined it would be during the training.
367 Following further discussion, participants identified that ‘things moved really quickly’
368 and they were ‘barely able to do more than commentate’. Indeed, the fast-paced nature
369 of the game and the low-level of detail provided in the verbalisations suggest that the
370 cognitive load was high for this particular task. That is, there was a lot of visual
371 information for Adam and Ben to observe, synthesise, and verbalise before the game
372 had already progressed. “It made keeping up with the game really hard...I felt like I’d
373 not finished [verbalising] but I needed to move on to the next bit.”
374 The informal debrief with both participants was conducted approximately five minutes
375 following the conclusion of the game. The debrief was short (19 minutes in total) but
376 indicated the need for the research team to consider different approaches to examining
377 the cognitive processes and strategies adopted by those responsible for talent
378 identification in junior-elite football. When we asked Adam and Ben to reflect on the
379 players that they were tasked with scouting in the second half it was interesting to note
380 that both disagreed with the player attributes and both disagreed regarding the
381 recruitment philosophy of their own club. Interestingly, the recruitment philosophy was
382 visible in the interview room – a vinyl graphic occupying approximately two-thirds of a
383 wall – when Adam and Ben were asked how accurate their thoughts and observations
384 were in relation to this, they responded by further disagreeing with their previous
385 verbalisations and aligning their responses to factors highlighted in the vinyl graphic.
386 Such dissonance between philosophies and on-the-ground practice have been reported
387 in previous studies [12, 14].

388 **Discussion**

389 The aim of this case study was to explore the use of a verbal reporting
390 methodology to better understand the thought processes of soccer scouts during a live
391 junior-elite soccer game. Study 1 developed a rigorous standardized verbal report
392 coding scheme to be used in the analysis of verbal reports. The standardized coding
393 form was created with the aim of providing an objective view of talent identification
394 attributes that could be used in a practical setting. The content validation of the coding
395 system suggests it is a versatile analysis tool which could be used to inform future talent
396 identification studies or the training of talent scouts.

397 In the second study, talent scouts' thoughts were captured during a live game utilising a
398 verbal reporting protocol [43] and verbalisations were analysed using deductive content
399 analysis. To our knowledge this is the first study to attempt to capture the thought
400 processes of talent scouts using concurrent verbal reports despite this methodology
401 featuring prominently in existing cognitive control accounts of skilled athletic
402 performance [49]. This study, therefore, acts as a preliminary first step in the applied
403 body of work in this area. Findings suggest that while the live-game observation yields
404 high ecological validity, the dynamic nature of football creates too many variables for
405 cognitions to be accurately verbalised due to time-pressures associated with the speed of
406 the game. Participants, whilst attempting to do so, found themselves commentating as
407 opposed to fully verbalising the cognitions of what they were seeing and how they were
408 making sense of it and so some caution is required when interpreting these findings.
409 Data suggested that Adam and Ben did not alter what or how they undertook scouting,
410 regardless of the task focus (*i.e.* full team versus specific players). Indeed, there was no
411 difference in the tone or number of verbalisations between the two tasks. When
412 focusing on a specific player(s) Adam and Ben's thought processes appeared to remain

413 game focussed when their intended focus (*i.e.* a specific player) was out of possession
414 and/or not particularly involved within a phase of play.

415 **Psychological attributes**

416 The most frequent perceptual-cognitive thoughts were coded as *decision-making* ($n =$
417 158) *off-the-ball thinking* ($n = 43$), and *positioning* ($n = 40$). The most frequent
418 psychological attribute thoughts was *attitude* ($n = 38$). Perceptual-cognitive skills such
419 as *decision-making*, and *off-the-ball thinking* are repeatedly reported to be advantageous
420 in team sports and soccer specifically [50, 51]. Decision-making ability in a team sports
421 such as soccer is commonly defined as the appropriateness of a decision, preceding a
422 suitable action and is relative to the game context and specific interactions which occur
423 between players of the same team and the opposition [52]. For example: “If my direct
424 defensive opponent is far away from me, then I will shoot; or, if he closes me down,
425 then I will do a step-over and drive past him” [53]. This ability to carry out two
426 concurrent skills (*i.e.* dribbling the ball while scanning the pitch for the opposition or
427 teammates) is considered an important attribute for performance in team sports [53].
428 The talent scouts in our study were coded when they explicitly commented on the
429 players’ on-the-ball decisions, however, like others [52] the quality of the decision was
430 difficult to assess, and as we did not explicitly assess whether the player decisions were
431 ‘appropriate’ or ‘inappropriate’ we recommend that further work is conducted in this
432 area. The high number of off-the-ball verbalisations is an interesting one especially
433 when the majority of these were captured during the first-half when the scouts were
434 requested to observe the whole game and not focus on a specific player or position.
435 When we analysed the GoPro footage and cross-referenced the off-the-ball
436 verbalisations it was apparent they were verbally reporting while still tracking the ball
437 and, therefore, processing large amounts of information. It would appear the scouts

438 were using effective visual search strategies, scanning the whole pitch and filtering lots
439 of contextual information very quickly. At this stage we acknowledge that this is pure
440 conjecture and requires more detailed experimental analysis in simulated conditions.
441 This is, however, an interesting supposition as eye fixations are known to be one of the
442 pre-requisites for superior performance in sport and other areas such as [54]. At this
443 stage we are not aware of any eye fixation work that has been conducted with talent
444 scouts or recruitment staff and although this is pure speculation at the moment, it may
445 be worthy of further investigation. The procedural knowledge involved in the
446 interpretation of a specific situation and the ability to be/or to get in the right place at
447 the right time (*i.e.* positioning) is known to be a prerequisite for excellence in team sport
448 [55]. *Positioning* is, however, dependent on systems of play, for example in a 3-5-2
449 system, the full-back or wide player (dependent on whether the team is in possession of
450 the ball or not) may need to act as an attacker or defender. Future talent studies,
451 therefore, may need to consider team formations and player positions *a priori*.

452 **Technical attributes**

453 The most frequent technical thoughts were attributed to *passing accuracy* ($n =$
454 104), *first-touch* ($n = 73$), and *dribbling/running with the ball* ($n = 38$). These findings
455 are consistent with previous talent studies in soccer such as Larkin & O’Conner [29],
456 who also reported first-touch and striking the ball as important. A technique was
457 defined as the ability to carry out a solitary action with minimal cognitive decision-
458 making. Passing accuracy (*i.e.* appropriate speed and angle) is considered an important
459 technical attribute, especially for teams with a ball possession style of play. Despite a
460 positive association between possession of ball time and team success [56] some
461 caution is required as ball possession is multifaceted by extenuating factors such as
462 playing style, quality of the opposition and the score of the match [57, 58, 59].

463 **Physiological attributes**

464 The most commonly coded physiological statement was *agility* ($n = 16$), however,
465 physiological verbalisations were considerably lower than psychological and technical.
466 Indeed, of the 727 verbalisations coded, only 56 (7.7%) were physical or physiological.
467 There is a long history of talent-related literature suggesting a pre-disposition, or bias,
468 toward physical and physiological factors associated with talent [6, 60, 61]. Indeed,
469 much of the literature pertaining to relative age effect (RAE) has indicated that junior-
470 players are more likely to be selected due to factors significantly affected by relative
471 age [62, 63, 64]. The two other highest coded attributes were *speed* ($n = 12$) and
472 *strength* ($n = 12$). Collectively, these three attributes have been considered in a number
473 of previous studies [65, 66, 67] and their findings now considered best evidence in
474 terms of the importance for talent identification, development, and monitoring purposes
475 [68].

476 **Hidden attributes**

477 *Communication* ($n = 24$) was the only statement that was coded from the hidden
478 attribute category. Similarly, this was the lowest coded attribute category, with only 24
479 (3.3%) verbalisations.

480 **Strengths and limitations**

481 Strengths of this study include a novel, two-study methodological approach to
482 capturing scouts' concurrent cognitions during in an *in-situ* environment. The study also
483 captures follow-up qualitative data in an attempt to understand any holistic or
484 philosophical differences regarding talent identification practice. A more
485 comprehensive study design should incorporate and include talent scouts from different
486 academies working colligatively, however, professional soccer clubs and their

487 academies are not renowned for working in partnership and instead tend to be recondite
488 about recruitment practice(s) [15]. This study, therefore, offers a unique insight into
489 talent scouts “thoughts” working in a professional soccer environment.

490 Despite these strengths, the study contains several shortcomings that need to be
491 considered by researchers in talent identification. Firstly, although independent IOA
492 estimates were acceptable, some of the coding constructs (*e.g. decision-making,*
493 *technique-under-pressure,* and *off-the-ball thinking*) required interpretation from the
494 research team. For example, it was difficult to distinguish between whether a decision-
495 making thought reflected an on-the-ball (*i.e.* a skill or technique) or off-the-ball action.
496 It is our contention that further validation of these constructs is required. Secondly, a
497 small purposive sample of English talent scouts was used and although this sample is
498 in-line with other verbal reporting studies [69] we acknowledge this as a less than
499 representative sample. However, professional soccer clubs in England are notoriously
500 secretive about their recruitment procedures and practices, and as other researchers can
501 testify gaining access and acceptance in these environments can be extremely difficult
502 [70]. Thirdly, as the qualitative data alludes to “thinking out loud” for the duration of a
503 full 90-minute game was mentally draining for the participants and difficult. This may
504 have impacted on how Adam and Ben undertook the two scouting tasks (*i.e.* whole team
505 identification versus observing specific players). Indeed, both may have, potentially,
506 been mentally fatigued following the first half and unable to differentiate between the
507 tasks adequately.

508 Despite the current methodological shortfalls, modified versions of the task presented
509 may offer future avenues for research in this area. Specifically, future research may be
510 better to adopt a more controlled, lab-based, environment to examine the cognitive
511 thought processes of scouts, and recruitment staff in more using larger sample sizes.

512 Following Eccles and Aarsal [71] we would also encourage a more detailed qualitative
513 component to future studies that captures the nuances of how club recruitment
514 philosophy influences the decisions made by staff responsible for this area of work for
515 the football club. Finally, examining eye fixation would be an interesting development
516 in this area so it is possible to determine where a scout is looking during a game.
517 Eventually, this research might generate more accurate and reliable information for
518 practitioners and researchers interested in understanding the complexities of the talent
519 identification process.
520

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