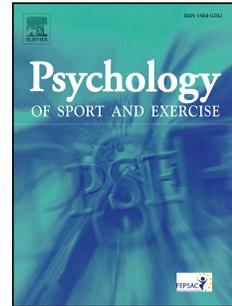


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Contextual factors influencing decision making: Perceptions of professional soccer players

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Running head: CONTEXTUAL FACTORS INFLUENCING DECISION MAKING

Contextual Factors Influencing Decision Making: Perceptions of Professional Soccer Players

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## Contextual Factors Influencing Decision Making: Perceptions of Professional Soccer Players

## Abstract

*Objectives:* This study sought to explore highly-skilled soccer players' perceptions of how contextual factors influence their decision making during matches.

*Design:* A qualitative design was used in which individual semi-structured interviews were conducted with eight professional male soccer players aged between 18 and 22 years.

*Method:* An interview schedule was designed to explore the perceived influence of a range of situational factors on decision making during matches. The interviews were recorded and transcribed verbatim. The data were analysed via an inductive thematic analysis.

*Results:* Seven themes were identified from the data. The four dynamic contextual themes were: (a) personal performance, (b) score status, (c) momentum, and (d) external/coach instructions. The three static contextual themes were: (a) match importance, (b) personal pressures, and (c) preparation.

*Conclusions:* The results highlight the importance of considering the dynamic and static context within which highly-skilled soccer players make decisions.

*Keywords:* context, decision making, soccer

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ACCEPTED MANUSCRIPT

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## 41 Contextual Factors Influencing Decision Making: Perceptions of Professional Soccer Players

## 42 1. Introduction

43 In sport, decision-making capabilities play a significant role in success with high-  
44 skilled performers often required to make the right decision under extreme time pressures  
45 (Kinrade, Jackson, & Ashford, 2015). Given the dynamic and complex sport environment,  
46 which involves myriad decisions, researchers have focused on various aspects of the  
47 decision-making process (Macquet, 2009) and have predominantly used a reductionist  
48 approach to examine selected aspects of perceptual-cognitive expertise, prioritising  
49 experimental control over ecological validity (Williams, 2009). Research in other time-  
50 constrained settings, such as with chess players (Chase & Simon, 1973) and medical experts  
51 (Verkoeijen, Rikers, Schmidt, van de Wiel, & Kooman, 2004), suggests that context is  
52 critical in assisting high-quality decisions. However, given the tighter focus required in  
53 experimentally-controlled designs, sport-specific studies have not considered the contextual  
54 complexity of typical match situations (Schlappi-Lienhard & Hossner, 2015).

55 With such unpredictability in sport, it has been suggested that researchers would  
56 benefit from going beyond examining individual perceptual-cognitive factors that guide  
57 performers' decisions by considering the behavioural interaction between performers and the  
58 real-life sport environment (Davids & Araújo, 2010; Travassos et al., 2013). In beginning to  
59 address this shortcoming, the aim of the present study is to examine soccer players'  
60 perceptions of how contextual factors influence their in-match decision making. In the  
61 present study, 'context' is defined as "the circumstances that form the setting for an event"  
62 (Oxford English Dictionary, 2018), in this case, circumstances before and during a match that  
63 influence decision making. Accordingly, it allows players to consider a broader range of  
64 environmental and personal factors than have typically been considered in studies of  
65 anticipation skill.

## 66 1.1 Decision Making Research from an Experimental Perspective

67 Since the work of Starkes and Deakin (1984), experimental research has revealed  
68 differences in the nature and type of decisions involved in sport (Bar-Eli & Raab, 2009). A  
69 number of researchers have applied the expert performance paradigm to sport, commonly  
70 using sport-specific film simulations to assess decision accuracy, response time and  
71 movement-based responses alongside process-tracing measures such as eye movement  
72 analyses and verbal reports (Ericsson & Ward, 2007). This has led to significant progress in  
73 identifying factors that contribute to successful decision making. For example, in soccer,  
74 superior performance was found to be characterised by faster decision times and greater  
75 response accuracy, underpinned by successful decision makers using more goal-orientated  
76 search strategies than their less successful counterparts (Vaeyens, Lenoir, Williams, &  
77 Philippaerts, 2007). Other researchers found that skilled soccer players made more fixations  
78 of shorter duration to more locations than less-skilled players when making decisions (Roca,  
79 Ford, McRobert, & Williams, 2013). In the task, players observed simulated match sequences  
80 filmed from the perspective of a central defender. In a second experiment, analysis of verbal  
81 protocols revealed that the more skilled players made more cognitive statements on each trial,  
82 reflecting greater domain-specific knowledge.

83 Sport-specific film simulation research has enhanced our knowledge of some of the  
84 processes underlying superior decision making; however, there has been relatively little  
85 progress made in understanding the role of contextual factors. The importance of context was  
86 evident in a study by McRobert, Ward, Eccles, and Williams (2011), who manipulated the  
87 information available to cricket batters. Skilled and less-skilled performers responded to  
88 video simulations of opponents bowling a cricket ball under low (24 balls from six bowlers,  
89 presented in random order) and high (24 balls from four bowlers, presented in six consecutive  
90 balls from each bowler) context conditions. The study revealed that skilled batters were more

91 accurate during the high-context condition compared to less-skilled batters, suggesting that  
92 the additional context allowed players to extract information from the relevant location more  
93 efficiently. Other contextual factors such as court position, shot sequencing, (Abernethy, Gill,  
94 Parks, & Packer, 2001; Murphy, Jackson, Cooke, Roca, Benguigui, & Williams, 2016), and  
95 inferred probability information (Gray, 2002a; Paull & Glencross, 1997) have also been  
96 found to aid judgment accuracy. Conversely, researchers have shown that response time,  
97 response accuracy, or response timing may be impaired when action outcomes are  
98 incongruent with expectations arising from contextual information, such as situational  
99 probability information (Barton, Jackson, & Bishop, 2013), baseball pitch count (Gray,  
100 2002b), and sequencing of volleyball shots (Loffing, Stern, & Hagemann, 2015). These  
101 findings provide preliminary support for the value of exploring other contextual factors that  
102 may be involved in sport-specific decision making. While research using sport-specific film  
103 simulations has progressed our knowledge of aspects of superior decision making, research of  
104 this nature lacks ecological validity in that it tends to focus on a small number of pre-  
105 determined contextual factors, thereby limiting our understanding of real-life sport decisions.

## 106 1.2 Toward a more Naturalistic Approach to Understanding Decision Making

107 One method employed to enhance ecological validity in the study of decision making  
108 is ‘naturalistic decision making’ (NDM), which centres around decisions made in natural  
109 situations (Schläppi-Lienhard & Hossner, 2015). NDM research considers complex, real-  
110 world settings that acknowledge the dynamic and uncertain conditions and real-time reactions  
111 to these uncertainties. NDM studies have investigated decision making in various high-  
112 pressure fields such as firefighting, nuclear power plants, aviation, military, paramedics and  
113 sport (Macquet, 2009). In sport, the primary method of data collection is self-confrontation  
114 interviews, in which each participant is confronted with a video of themselves playing in a  
115 real match and is asked to “think aloud” (Macquet, 2009). Unlike laboratory studies using

116 film simulations, which require immediate responses to an observed scenario, self-  
117 confrontation interviews do not involve actively making any decisions, but rather focus on a  
118 discussion around previously made decisions. The idea is to elicit concurrent cognitions and  
119 salient features considered by the players during their own real-life impromptu match  
120 decisions (Hoffman, Shadbolt, Burton, & Klein, 1995).

121 NDM research in the sport domain has revealed the significance of match-specific  
122 contextual factors. One study revealed that expert badminton players only tried to finish a  
123 point when situational conditions of the rally were perceived to be favourable to winning the  
124 point (Macquet & Fleurance, 2007). More broadly, the players expressed that their intentions  
125 and decisions reflected the contextual development of a rally and that their situational  
126 understanding was informed by past events and current player competencies. Macquet and  
127 Kragba's (2015) study of basketball players produced analogous findings, in which the  
128 players revealed that they considered teammates' and opponents' placements, moves, and  
129 actions, when assessing the situation and anticipating how the situation would develop.  
130 Similarly, a study of handball players illustrated that decision making relied, at least in part,  
131 on situational progression of the match (Lenzen, Theunissen, & Cloes, 2009). More  
132 specifically, the players' verbal reports suggested that their decision making involved  
133 perception, knowledge, expectations, and contextual elements, demonstrating the influence of  
134 dynamic contextual factors on the players' decisions. While extant literature has highlighted  
135 the value of considering individual contextual factors when exploring decision making in  
136 sport, the research remains limited in its ability to capture the full complexity of contextual  
137 influences (McRobert et al., 2011).

### 138 1.3 Study Objective

139 Overall, while the NDM research has made progress in understanding the role of  
140 contextual information and its interaction with perceptual-cognitive processes in sport, there

141 appears to be a narrow focus of self-confrontation interviews as the method for data  
142 collection. In self-confrontation interviews, the performer is restricted to deliberating on  
143 specific decisions made within the particular context of a single match. This method,  
144 therefore, does not allow for a broader consideration of the types of decisions made in sport  
145 and the perceived importance of contextual factors. In an effort to capture a wider array of  
146 contextual factors involved in decision making in top-level soccer, the present study  
147 employed semi-structured interviews to examine professional players' perceptions of how  
148 contextual factors influence their decision making. Semi-structured interviews allow  
149 performers to organically recognise salient contextual factors and their influence on the types  
150 of decisions made in soccer more generally, without limitation of discussion around decisions  
151 made in a single match. Accordingly, the objective of the study was to identify contextual  
152 factors the players perceived to be important and how they influence the decision-making  
153 process.

## 154 2. Method

### 155 2.1 Participants

156 Eight male professional soccer players participated in the study. The participants had  
157 a mean age of 19.0 years ( $SD = 1.4$ , range = 4.0), had been competing at the professional  
158 level for a mean of 2.0 years ( $SD = 1.9$ ), and included two defenders, four midfielders, and  
159 two attackers.

### 160 2.2 Recruitment

161 Following approval from the University's Ethical Approval Committee, purposive  
162 sampling was used to recruit elite level participants from a highly successful English Premier  
163 League Soccer Academy Under-23 team. The participants were initially informed about the  
164 nature and purpose of the study by their coach and those who expressed an interest in  
165 participating were then scheduled to meet with the researcher. More specific details of the

166 research study were then given to participants and interviews were scheduled with those who  
167 agreed to participate.

### 168 2.3 Interview Guide

169 To gather relevant data, a semi-structured interview guide was developed in  
170 accordance with the principles set out by Braun and Clarke (2006). The interview guide was  
171 then checked and modified following a pilot interview, which highlighted the need to  
172 rephrase and reorder some of the questions.

173 The interview guide opened with questions about the participant's decision making  
174 associated with their playing position, then targeted contextual factors relating to coach  
175 instructions before and during a match, perceived personal, own team, and opposing team  
176 strengths and weaknesses, the referee, and a range of specific situational factors. There was a  
177 question regarding the extent to which training took into account the contextual factors  
178 discussed before ending with giving the participants an opportunity to share any additional  
179 contextual factors they believe impact their decision making. Sample questions included:  
180 "can you describe the decision making part of playing in your position?", "to what extent do  
181 you think instructions given to you during a match influence your decision making?", and "is  
182 there anything else that you would like to add that you think influences your decisions during  
183 matches?".

184 While the broad structure of the interview was the same for all participants, the order  
185 of questions was dependent on participants' responses. The interviewer always started by  
186 asking for an example of a decision-making scenario from a match to get the participant  
187 thinking about specific match situations. After the first example, the interviewer asked for  
188 additional examples whenever contextual factors were reported to affect decision making.  
189 Impromptu clarification and elaboration probes were used throughout the interview. For  
190 example, questions such as, "in what way?", and "can you give me an example?" were used

191 to gain further insight into how a contextual factor influenced their decision making. Thus,  
192 while the interview was structured around broad contextual themes, there was scope for  
193 exploring in more depth those deemed to have an effect on decision making, for example,  
194 through use of elaboration probes.

#### 195 2.4 Data Collection Procedure

196 Prior to their interview, each participant was given a written and verbal  
197 description of the study and its objectives. Each participant was made aware that all the  
198 information they shared would remain confidential, would be used solely for the purpose of  
199 the study, and that only a generic and anonymous summary of potential practical implications  
200 arising from the study would be made available to their coaches. They then signed a consent  
201 form and completed a participant information form.

202 The interviews were conducted in a quiet room on the soccer academy premises for  
203 participant convenience. All interviews were scheduled either prior to or following a training  
204 session and lasted between 26 and 43 minutes ( $M = 35.91$  minutes,  $SD = 6.74$  minutes). The  
205 interviews were not conducted under time pressure and therefore none had to be aborted.

206 A semi-structured interview is often more conversational than a strictly structured  
207 interview (Smith, 1995); therefore, the contextual factors that were most salient to  
208 participants became apparent through discussion. This flexible approach allowed for  
209 unexpected findings to emerge since participants were encouraged to discuss contextual  
210 factors unconstrained by pre-determined questions. The interviewer had competed in soccer  
211 at a professional level and therefore possessed contextual knowledge and understanding of  
212 the sport-specific terminology. Consequently, the interviewer did not have to ask for  
213 additional clarification questions about use of 'jargon', which facilitated the development of  
214 good rapport and ease of conversation with the participants.

#### 215 2.5 Data Analysis

216 Each interview was recorded and transcribed verbatim. To ensure confidentiality and  
217 anonymity throughout the analytic process, pseudonyms were assigned to each participant.  
218 The interviews were read twice in order to fully immerse the researcher in the transcripts. The  
219 data were then analysed using an inductive thematic analysis. This method generates an  
220 analysis from the data itself (i.e., inductive) and is therefore not constrained by pre-existing  
221 theory (Braun & Clarke, 2006).

222 The analysis followed a recursive process based on the six phases developed by Braun  
223 and Clarke (2006). The first phase involved becoming familiar with the data through  
224 transcription, preliminary readings, and making note of initial observations and ideas. The  
225 second phase entailed a process of complete coding in which features related to the influence  
226 of contextual factors on decision making were coded across the entire data set and then  
227 collated. In the third and fourth phase, the relevant codes were organised into potential related  
228 yet distinct themes, which were then cross-checked with the coded extracts and full data set  
229 and finally generated into a thematic ‘map’ of the analysis. The process of creating a thematic  
230 ‘map’ comprised of combining the first and second-order themes into suitable groups. The  
231 next stage consisted of an ongoing analysis to refine the detailed features of each theme,  
232 along with finalising clear definitions and names for each. The sixth and final phase required  
233 producing the written report through a selection of apt and compelling extract examples that  
234 relate the analysis to the research question and appropriate literature.

### 235 3. Results and Discussion

236 Given the contention surrounding what constitutes validity in qualitative inquiry, this  
237 study is in accordance with the eight key criteria proposed by Tracy (2010): worthy topic,  
238 rich rigor, sincerity, credibility, resonance, significant contribution, ethics, and meaningful  
239 coherence. From the data, seven contextual themes emerged that were perceived as having an  
240 influence on the players’ decision making. These were grouped under two higher-order

241 themes according to their static or dynamic nature. The four dynamic contextual themes  
242 were: personal performance, score status, momentum, and external/coach instructions. The  
243 three static contextual themes were: match importance, personal pressures, and preparation.

### 244 3.1 Dynamic themes

245 The players revealed that their decisions on the pitch relied on the situational  
246 development, or in other words, the dynamic nature of the match. More specifically,  
247 participants suggested that certain dynamic contextual factors, such as positive perceptions of  
248 their performance, a winning score status, and positive momentum resulted in more confident  
249 decision making, which was often characterised by experimental or risky decisions. The  
250 players also suggested that in certain contexts within a match, instructions from their coach  
251 were valued while in others they could hinder the decision making process. This reveals how  
252 the transient and dynamic nature of the match impacts the internal psychological process  
253 through which players make decisions.

254 3.1.1 Personal performance. Every player highlighted that their perceptions of  
255 personal performance during a match impacted the decisions they made. More specifically,  
256 their own performance was a key source of confidence for the players, with high confidence  
257 leading to more adventurous decision making and low confidence leading to more  
258 conservative decision making:

259 With me, if I'm like playing well, I'll try anything, so like, it's more of a confidence  
260 thing, like, if when the ball comes to me, the first thing I normally try and do is 'right  
261 get a safe pass off' and then build from there. And then if I'm having a bad game, I  
262 think 'right I'm just gonna play safe' so it would effect my decisions... but if I'm  
263 having like a really good game then my confidence goes up and I'll just try anything.

264 (Matt)

265 All of the participants spoke about how their confidence increased throughout the  
266 match when they were playing well, which progressively increased their willingness to make  
267 more risky decisions. Moreover, some players suggested that the first five or ten minutes of a  
268 match were disproportionately important for building confidence. For example, when talking  
269 about making more risky decisions, one player expressed:

270 I think what does have an effect, say your first five minutes of a game or your first ten  
271 minutes if you're playing well then... I would say more importance on the start of the  
272 game than necessarily previous games or training sessions. (Henry)

273 It is evident that a large part of confident decision making during a match was  
274 dependent on their performance *on the day*. Whether it be through the first five or 10 minutes  
275 or throughout the entire match this aligns with Bandura's (1997) self-efficacy theory,  
276 specifically the prediction that performance accomplishments will elicit the most potent  
277 effects upon self-efficacy. While the participants used the term 'confidence', their comments  
278 also highlight the situational and time-specific nature of their self-efficacy in regard to  
279 decision making.

280 3.1.2 Score Status. The participants identified that score status often impacts the  
281 types and emotional valence of decisions they make throughout a match. More specifically,  
282 they identified being in a winning position as a prominent determinant of making more  
283 confident decisions, while being in a losing position was recognised as a basis for more  
284 communication to guide their decisions. For example, John exclaimed, "when we're winning  
285 I feel confident in my decisions", while another player highlighted the link between winning,  
286 confidence and effective decision making:

287 Simon: If you're winning I think you're probably naturally making better decisions.

288 Interviewer: Why? Why do you think that?

289 Simon: Erm confidence.

290 Some players posited that being in the lead during a match was essential for making  
291 confident decisions. This is consistent with previous research in which winning was found to  
292 significantly predict confidence in males (Jones, Swain, & Cale, 1991) and that, in  
293 comparison to females, male performers place a greater emphasis on winning, beating others,  
294 and successful competition outcomes (Hays, Maynard, Thomas, & Bawden, 2007). While it  
295 is beneficial for performers to gain confidence from taking the lead during a match, the fact  
296 that confident decision making is so reliant on the scoreline again highlights its potentially  
297 transient nature. Sensitivity to the context in which one is performing is clearly important;  
298 however, there appears significant scope for developing decision-making skills that are more  
299 robust and resilient to the situational context.

300 When confronted with a situation in which the team was losing, the players revealed  
301 that they had a greater inclination to allow others to guide their decisions. Whether from  
302 teammates or coaches, communication was considered fundamental to avoid conceding more  
303 goals:

304 If we're losing of course, and they wanna switch it around and start pressing the ball  
305 back and going to score, then it's vital we listen, there is communication, 'cause if no  
306 one's talking then we probably concede more and more goals. (Brad)

307 When a team is losing, or feeling a lack of control of the game, it is reasonable to  
308 want to change the tactics or style of play and these comments reflect the perceived  
309 importance of communication in ensuring this is done cohesively (Carron, Colman, Wheeler,  
310 & Stevens, 2002). There is mixed evidence regarding the relationship between score status  
311 and frequency of communication. In a study of netball, researchers found that more frequent  
312 on-court talk was associated with less-successful outcomes (LeCouteur & Feo, 2011).  
313 Conversely, in a study of tennis, winning doubles pairs exchanged twice as many messages as  
314 losing teams (Lausic, Tenebaum, Eccles, Jeong, & Johnson, 2009). The present interviews

315 suggest that increased communication between players is simply a response to tactical  
316 changes resulting from score status, and this is perceived to be beneficial.

317         3.1.3 Momentum. Another dynamic situational factor that affected the players'  
318 decision making was momentum, which was described as a period during which one team  
319 had large amounts of possession and/or instigated repeated attacking play. Despite the feeling  
320 of momentum usually only lasting a few minutes in a match, it appeared that this was  
321 sufficient to influence the confidence of players' decision making. For example, one player  
322 said, "I think, well, when you have momentum you have more confidence" (Craig). Despite  
323 limited research in this area, this finding is consistent with the reconceptualised model of  
324 sport confidence in which situational favourableness was identified as a salient source of  
325 confidence for athletes (Vealey, Hayashi, Garner-Holman, & Giacobbi, 1998). Situational  
326 favourableness represents the idea that performers gain confidence in situations where they  
327 feel the breaks are in their favour. Interestingly, such favourableness is apparent regardless of  
328 the score, suggesting an alternative, if somewhat unreliable, source of decision making  
329 confidence.

330         In light of the quotes that suggest confidence is generated through momentum, it is  
331 perhaps unsurprising that when momentum was not in their favour, players made less-  
332 confident decisions or employed a more conservative decision making strategy to try to  
333 counteract momentum:

334         If you [are] against it, against momentum, I think it's quite difficult. You gotta do like  
335 the basic things right and not take risks. You just gotta try and keep it simple and just  
336 do all the basic things properly just to get that bit of pressure and momentum off you  
337 a little bit and try and lift your team up. (Scott)

338         While Scott did not explicitly acknowledge a lack of confidence when momentum  
339 was against his team, he referred to the importance of 'keeping it simple', in contrast to the

340 more risky or low-probability decisions the players identified as making when confident. This  
341 is an apt example of the powerful yet transient influence of context on decision making. A  
342 contextual factor, momentum, over which players perceived that they had little control and  
343 that lasted only a few minutes, nonetheless resulted in strategic deployment of a more risk-  
344 averse and interactive decision making strategy. Rather than trying to score a goal, the  
345 primary concern of players shifted to low-risk decisions, the outcomes of which were more  
346 assured. Previous decision-making research in soccer has primarily focused on offensive  
347 scenarios; however, the value attached to more conservative decision making in certain match  
348 situations highlights the importance of considering the context in which decisions are made to  
349 develop a more comprehensive understanding of in-event decision making. In certain  
350 contexts, decisions that lead to a goal-scoring opportunity would not necessarily be  
351 considered superior, as has been assumed in more offence-focused studies (Roca et al., 2013;  
352 Vaeyens et al., 2007).

353 3.1.4 Coach instructions. Throughout the interviews, it became apparent that there  
354 were certain contexts in which coach instructions were valued and others where they were  
355 considered potentially detrimental to decision making. For example, when the players were  
356 given advice while they were in possession of the ball, they felt this interfered with the  
357 fluency of their decision-making process:

358 I don't like it when I'm playing football and especially, you know, like, if you play  
359 right or left back, you're right by the touchline and sometimes if you're right by the  
360 dug out, you get the ball at your feet and someone will go 'ah give it to Joe' and in my  
361 head I'm already thinking I'm gonna pass it to someone else, then I'm like 'ooh', so I  
362 don't like it when they say something. I'd rather just in the moment, I'd rather I just  
363 make the decision. (Matt)

364 Some of the players articulated how they often made decisions before receiving the  
365 ball so when they were given instructions after gaining possession of the ball the decision-  
366 making process was more challenging. These players expressed negative reactions caused by  
367 ill-timed instructions, noting how they can “put you off your game” (John) and “I wouldn’t  
368 say confuse I would say if anything maybe annoyed” (Henry). The danger with triggering  
369 ‘reinvestment’ of explicit processes is well established in the motor skill literature and similar  
370 individual difference factors have been identified in decision making (Kinrade et al., 2015).  
371 Accordingly, the role of in-event instructions in triggering these processes warrants further  
372 investigation.

373 In certain contexts such as in areas of perceived weakness, or following poor  
374 decisions, the participants expressed a preference for guidance on decision making. For  
375 example, one player articulated the importance of listening to advice after making an error:

376 If you made a mistake and they’re trying to tell you to do it differently and that will  
377 help you not make a mistake, then yeah, you should listen to what they’re saying a  
378 hundred per cent. (Simon)

379 This was reflected in position-specific preferences, in which attacking players  
380 expressed a stronger preference for in-match instructions from their coach for defensive  
381 decisions, in contrast to preferring more freedom to make decisions in attacking decision-  
382 making situations. The reverse was true for defensive players. Taken together, this indicates  
383 situation-specific expertise is an important contextual factor that influences the decision-  
384 making process, even within a group who are highly skilled. This is reflected in a preference  
385 for using personal judgement in areas of perceived proficiency, and for seeking guidance in  
386 situations of perceived weakness. This is consistent with a recent study in Australian-rules  
387 football, which showed that experienced players relied more on their “know-how” to guide  
388 their decisions, whereas less-experienced players were more likely to adhere to coach

389 instructions (Buszard, Farrow, & Kemp, 2013). By implication, coaches and managers may  
390 benefit from prioritising in-match instructions regarding areas of perceived weakness in their  
391 players.

### 392 3.2 Static themes

393 During the interviews the participants revealed that to understand in-event decision  
394 making, one must also look beyond the dynamic context of the match to that of more  
395 external, or static contextual factors. The participants recognised that contextual factors that  
396 did not change throughout the match, such as the match importance, personal pressures, and  
397 preparation, contributed to the decisions they made on the pitch. More specifically, whether  
398 in response to the importance of a match or personal incentives to play well, the players  
399 suggested that perceived pressure sometimes impaired the spontaneity or fluency of their  
400 decision making. Furthermore, players' perceptions of how they had prepared for the match  
401 influenced the decisions they made on the day.

402 3.2.1 Match importance. In addition to the contextual factors that develop during a  
403 match the participants suggested that the broader significance of the match also influences  
404 their decision making on the pitch. There was considerable variability in the amount of  
405 pressure perceived by the participants and the extent to which this was affected by the  
406 importance of the match. Indeed, one participant described being indifferent to the  
407 significance of the match, going as far as to say, "yeah for sure I don't feel the pressure"  
408 (John), while another participant was clear that match importance had adversely affected his  
409 decision making:

410 In a cup final you want to win, like, a lot more, so it may be that you make a few rash  
411 decisions because you're, you wanna score so much that you actually make the wrong  
412 one a couple of times. (Henry)

413 This participant revealed that perceived pressure led to more direct, rushed, and even  
414 rash decisions. In contrast to the effect of coach instructions that may confuse and slow down  
415 the decision-making process, the comments are more consistent with attention control theory,  
416 in particular with reduced inhibition of responses and greater influence of the stimulus-driven  
417 attentional system (Eysenck, Derakshan, Santos, & Calvo, 2007).

418 Variability in reactions to match significance reflects evidence supporting the  
419 importance of individual difference factors in responses to pressure situations. For example,  
420 trait activation theory predicts that specific trait-relevant situational cues trigger behavioural  
421 responses to situations (Tett & Guterman, 2000), while other researchers have identified an  
422 inverse relationship between neuroticism and performance under pressure in decision making  
423 scenarios (Byrne, Silasi-Mansat, & Worthy, 2015). Individual differences in the propensity  
424 for reinvesting conscious control and ruminating over past poor decisions are also strong  
425 predictors of poor decision making under pressure in sport (Jackson, Kinrade, Hicks, &  
426 Wills, 2013; Kinrade et al., 2015). The implication of this is that a full understanding of  
427 decision making requires consideration of both the external and internal context in which  
428 situations are experienced and decisions made. More detailed knowledge of these  
429 relationships should lead to practical benefits in terms of individualised preparation for  
430 important events.

431 3.2.2 Personal pressures. During the interviews, the participants were invited to  
432 identify additional sources of pressure they believed influenced their decision making. At this  
433 stage a number of sources of perceived pressure were revealed as having the potential to  
434 impact on-field decision making. For example, one player referred to the on-going pressure  
435 associated with regularly competing at this level, stating, “in football there’s always  
436 something at stake” (Craig). Contractual status was also identified as an additional influence  
437 and potential source of pressure:

438 If you're on the verge of getting a new contract you want to give yourself the best  
439 negotiation cards that you can have then you get pressure from that... because you're  
440 playing on maybe two-year contracts one-year contracts three-year contracts so your  
441 future is as much as you're playing for that game you're also playing for the next  
442 game so staying in the team is one thing. (Craig)

443 Researchers have identified a range of internal and external sources of perceived  
444 pressure (Rushall & Sherman, 1987) and these examples highlight the broader competitive  
445 and organisational context in which players perform. The effect of additional sources of  
446 pressure on decision making has been established in other domains such as public health  
447 (Zardo, Collie, & Livingstone, 2014) but is yet to be systematically examined in more time-  
448 constrained decision making such as those found in sports and therefore warrants further  
449 investigation.

450 3.2.3 Preparation. The players' responses throughout the interviews suggested that  
451 their perceptions of how well they had prepared for a specific match influenced their decision  
452 making on the pitch. Training sessions that focused on decision making were considered an  
453 important determinant of in-match decision making; indeed, one player suggested that  
454 training was the most influential factor, "I think game-based [training] is a massive, has a  
455 massive effect on how good or bad your decision making is... I would argue potentially the  
456 biggest [influence]" (Henry). Despite all the participants recognising the significance of their  
457 practices on their decision making, there was considerable variation in their proposed  
458 rationales for why such preparation was so influential.

459 The idea of creating habits through practice surfaced as one explanation, "you try to  
460 do obviously, the things you wouldn't do in a match, in training, so you can get used to them  
461 and create habits and just goes on to the pitch with you as well" (Brad). Another player  
462 expressed the importance of replicating situations that are likely to occur in the match:

463 I find football personally like a memory thing, like if you can, if your brain can realise  
464 that you've been in this situation before, you will be able to get out of it... so I think  
465 in training if you're doing something and it comes up in a game you'll know exactly  
466 what to do because it's a memory thing. (Simon)

467 Pattern recognition, visual search, and associated thought processes are important  
468 determinants of decision-making proficiency (Roca et al., 2013) and participants revealed this  
469 was explicitly reflected in scenarios enacted during training sessions. It was also  
470 acknowledged that the training sessions during the week leading up to each match were  
471 particularly powerful in relation to decision making on the pitch. One player noted that the  
472 recency of training may impact his decisions, "because if you [have] been doing it all week  
473 so that would probably play on your mind so I think it could change the decisions you make"  
474 (Scott). Another player also fixated on the week of training between matches, suggesting that  
475 the focus on the upcoming opponent was pivotal to the success of in-event decision making:

476 The last match we did practice the day before the game and it was, we were walking  
477 through ways of or to defend against a team, so the team that we played like to pass  
478 the ball a lot and try to go through the third to play, so we tried to make the pitches as  
479 small as possible so they go around instead of through us. (John)

480 In regard to time-pressured decision making, the Take the First (TTF) heuristic  
481 predicts that when confronted with familiar, yet ill-defined tasks, performers generate only a  
482 very small number of options and tend to choose the first option that comes to mind (Johnson  
483 & Raab, 2003). Raab and Laborde (2011) found that higher-skilled handball players  
484 generated fewer options than less-skilled players and that the number of options generated  
485 was negatively correlated with decision quality. Viewed through this lens, the training  
486 sessions leading up to a match can be seen as 'contextual preparation', in which knowledge  
487 of the opposing team's strengths, weaknesses, and tactical preferences are used to sensitise

488 players to the formations they are likely to experience and constrain the decision options they  
489 might generate, resulting in faster and better decisions (Helper & Feltz, 2012). Accordingly,  
490 TTF heuristic offers a potential conceptual framework for guiding how performance analysis  
491 data is used to enhance in-match decision making.

#### 492 4. Conclusion

493 In the present study we sought to identify contextual factors that professional soccer  
494 players perceive to be important in influencing their decision making during a match. In light  
495 of the broad nature of the research question, semi-structured interviews were conducted as  
496 they allow for a general consideration of the types of contextual factors involved in decision  
497 making without restriction of decisions made in one match, as is the case in self-  
498 confrontation interviews. Nonetheless, it is important to acknowledge that in designing the  
499 semi-structured interview protocol, a range of contextual factors were specified and these  
500 may have affected the responses of participants. In particular, while great care was taken to  
501 ensure individual questions were not leading, the very fact that a contextual theme was  
502 mentioned may have increased participants' perceptions of its importance. To counteract this,  
503 care was taken to ensure questions were frames neutrally and elaboration probes were only  
504 used when participants indicated that a contextual factor affected decision making in some  
505 way.

506 The present study revealed that soccer players' decisions on the pitch rely on both the  
507 situational development of the match (i.e. dynamic themes) and the broader external context  
508 of the match (i.e. static themes). Consistent with previous research highlighting the  
509 importance of situational determinants of decision making (Lenzen et al., 2009; Macquet &  
510 Fleurance, 2007; Macquet & Kragba, 2015), the present study revealed that in-match factors  
511 such as perceptions of performance, a winning score status, and momentum were perceived  
512 to have a significant influence on the players' ability to make more confident decisions. The

513 players also suggested that instructions from their coach during a match were sometimes  
514 valuable (e.g., guidance following poor decisions), and at other times a hindrance (e.g., when  
515 in possession of the ball) on their decision making process. Furthermore, the present study is  
516 the first to provide (qualitative) data concerning the impact of broader static contextual  
517 factors on soccer players' decision making. More specifically, the participants suggested that  
518 the importance of a match and personal incentives to play well sometimes impaired the  
519 spontaneity or fluency of their decision making. They also revealed that they perceived  
520 training sessions in the days leading up to a match to be critical for providing a match  
521 specific context that facilitated effective decision making in the match itself.

522         It is important to remain cognisant that this study merely sought to explore and  
523 identify the broad array of contextual factors that influence soccer players' decision making.  
524 The broad scope of the study meant that it was impossible to establish the specific way that  
525 such factors combine to influence decisions, but we suggest this should be addressed in future  
526 studies. Likewise the study sample contained only male soccer players from one academy, so  
527 it is possible that players from a different demographic (e.g., age group, gender, culture) will  
528 identify additional contextual factors. Furthermore, it is likely that both the contextual factors  
529 and their influence on decision making changes during skill development. Large-scale cohort  
530 designs and longitudinal research will further develop knowledge in this area. A further  
531 limitation of the study is that it relied on the accuracy of the participants' recall, together with  
532 their ability and willingness to articulate their experiences. Whilst the quality and depth of the  
533 responses provided would suggest these were not serious problems, they must be considered  
534 in evaluating the findings of the study.

535         The present findings highlight the importance of considering the context in which  
536 decisions are made, and reveal how confident, effective decision making is subject to both  
537 dynamic and static contextual influences. More detailed examination of each of these

538 contexts is warranted and there is also a clear need to determine the extent to which the same  
539 contextual influences are common across different sports and other domains. Variability in  
540 regard to the perceived impact of situational pressure highlights the importance of identifying  
541 and measuring key individual difference variables in empirical research on decision making.  
542 While challenging, this will lead to a more comprehensive understanding of decision making  
543 in sport that should yield theoretical as well as practical advances.

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ACCEPTED MANUSCRIPT

## Contextual Factors Influencing Decision Making: Perceptions of Professional Soccer Players

### Highlights

- Semi-structured interviews were conducted with eight professional soccer players
- Static and dynamic contextual themes were perceived to influence decision making
- Dynamic themes related to performance, score status, momentum, and communication
- Static themes related to match importance, perceived pressure, and preparation