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Utilising experiential knowledge of elite match officials: Recommendations to improve practice design for football referees

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Cultural and financial growth in football has seen an increased level of scrutiny on the performance of match officials. Although the professionalisation of officiating in football has seen an increase in research and practice to improve decision-making, such practice lacks 'functionality' and accurate representation, attributed in part to the absence of qualitative data from officials. This study aimed to acquire and interpret experiential knowledge of elite football referees to improve practice design. Three FIFA and UEFA listed match officials with 61 years of combined experience (M = 20.3; SD = 2.49) were interviewed. Thematic analysis revealed both proximal and distal constraints on performance, represented in five higher order themes of performance environment, governing body environment, individual constraints, media and social media influence, and societal views, that are presented using Bronfenbrenner's ecological systems model. The constraints identified inform recommendations for representative practice design to improve the performance of match officials.

KEY WORDS: Affective learning, Ecological systems, Functionality, Representative learning design, Thematic analysis.

Introduction

Given the cultural significance of football around the world, match officials have long been subject to scrutiny from the public and media (Webb, 2016; 2017). This interest has been reflected by academic researchers paying

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increased attention to match officials, with almost half (49.5%) of all research articles on referees having been published since 2010 (Hancock et al., 2021). Much of the research investigating referee performance has focussed on exercise physiology (e.g., see Castillo, 2016, 2017; Monteiro, 2014; Weston, Drust & Gregson, 2011), however decision-making is equally important to consider as elite referees make an average of 137 explicit decisions per match (e.g., penalising and sanctioning foul play, indicating method of restart when ball goes out of play, awarding goals; Helsen & Bultynck, 2004). The importance of this decision-making is magnified given the financial implications of correct or incorrect decisions (Jamieson, 2010; Larkin et al., 2011), whilst the dynamic nature of the environment in which referees perform makes such decision-making particularly challenging (Catteeuw et al., 2009; Helsen, Gilis & Weston, 2006; Hossner et al., 2019).

When considering factors that affect performance, it has recently been shown that contextual factors related to the task and the environment surrounding an event influence the actions of performers. For instance, in rugby union, Pocock et al. (2018) reported that success rate of international place kickers was affected by the time in the match when kicks were taken, the score line, and whether previous kicks were successful or not. This is consistent with research in football, with contextual factors such as stress, fatigue, team history, individual status, post-success behaviour and self-regulation strategies shown to influence outcomes of penalty kicks (Furley et al., 2012; Jordet, 2009a; 2009b; Jordet et al., 2007; Moll, Jordet & Pepping, 2010). Given this evidence that contextual factors affect elite sports performers, it is possible that such external and contextual factors may similarly affect performance and decision-making of match officials. Dohmen and Sauermann (2016) reviewed studies that had explored the role of external factors in the performance of match officials, proposing that inconsistencies in decision-making were grounded in the referees' attempts to appease the crowd and receive a 'social payoff', such as approval (or the absence of criticism). Such inconsistencies are manifested in the amount of stoppage time played and likelihood of awarding significant decisions (e.g., penalty kicks) based on score-line and previous decisions (Corrigan et al., 2018; Garicano, Palacios-Huerta & Prendergast, 2005; Plessner & Betsch, 2001; Sutter & Kocher, 2004), and away team players being more likely than home team players to be penalised for foul play (Boyko, Boyko & Boyko, 2007; Nevill, Balmer & Williams, 2002). Refereeing performance, therefore, appears to be influenced by context, with such inconsistency regarding decision-making incongruent with Federation Internationale de Football Association's (FIFA, the international governing body for football) mission statement that "Football

is a global sport and its rules must be interpreted and applied with absolute consistency wherever the game is played." (FIFA, n.d.)

The importance of decision-making, coupled with evidence that decision-making is affected by external and contextual factors, has stimulated the development of off-field methods to train and improve decision-making skills, with video-based training methods being the dominant approach that has been employed with match officials (MacMahon et al., 2007; Spitz et al., 2018). The appeal of video-training is understandable. It is cost effective, reduces the risk of injury that is associated with 'on-field' exercises, and can promote development of perceptual-cognitive skills, which have been identified as distinguishing between sub-elite and elite referees (Helsen & Bultynck, 2004; Spitz et al., 2016; 2018). However, video-training must not be seen as panacea for referee development. Helsen and Bultynck (2004) commented that video training methods alone are not sufficient to develop officials to elite level, with an advanced understanding of the environment recognised as being integral to developing and understanding elite performance in football officials.

Attributing an effect (e.g., improved officiating performance) to a sole cause (e.g., increased perceptual-cognitive skills through video-based training) is a deductive approach to research that does not acknowledge the holistic contribution and interaction of external factors to behaviour (Henderson, 2011). Limitations of such deductive approaches are captured in theories of representative design (Brunswik, 1956; Pinder et al., 2011), which outline that when investigating and seeking to understand behaviours of interest, it is essential that the research environment captures those factors which affect performance in the performance environment (termed 'functionality'). Video-based methods may therefore be limited in their ability to identify the factors affecting referee performance based on their failure to capture contextual information or by presenting information from a different viewing angle to that which referees normally make decisions from, thus altering the perceptual information to which participants are exposed and not satisfying the requirement of 'functionality' (cf. Pinder et al., 2011).

In isolating a particular feature of performance in an attempt to enhance it, traditional video-training adopts a reductionist view to skill acquisition, with researchers working under the assumption that expertise is best developed with the absence of emotional constraints (Lewis & Granic, 2000). However, such an approach is potentially limited given that context and emotional responses have been reported to affect performance and decision-making. For instance, Neil et al. (2013) reported a Level 5 official stating that a decision to penalise a player was borne from fear of criticism or claims of bias from the opposition if they did not take action, while a pro-

fessional referee expressed concern about the potential for negative media attention following a decision. Consequently, video-training alone promotes a traditional bias in psychology that performance is attributed solely to the individual, as opposed to the organism-environment relationship (Brunswik, 1955; Pinder et al., 2011; Ziegler & Horstmann, 2015). This is inconsistent with the theoretical framework of affective learning design (Headrick et al., 2015), which posits both the need and benefits of incorporating thoughts and emotions, including negative ones, into practice design.

Recently, researchers have begun to consider the influence of environmental constraints on performance of match officials and have sought to incorporate these in study design. Samuel et al. (2019) assessed football officials' decision-making accuracy with and without context while running on a treadmill to replicate physical demands experienced by referees. Participants were shown 60 minutes of a game 'in context' (e.g., in sequence, with knowledge of time and score, and exposure to crowd noise) or 'mixed' (e.g., incidents shown in a random order with the absence of crowd noise and information regarding time and score). Results showed that, while there was no significant difference between general decision-making accuracy across the two groups, refereeing 'in context' significantly improved the accuracy of issuing yellow and red cards. This suggests the inclusion of contextual factors assists officials' anticipation and understanding of events. While the use of images from a television camera angle, meaning the decision-making viewpoint was not representative of a match official's, is cited as a limitation, referees often lack the ideal viewing angle, and all incidents were judged using the same perspective. A more pertinent limitation, therefore, is the absence of any social pressures that are claimed to influence consistency (see Dohmen & Sauermann, 2016). In another study that addressed the issue of social influence, Nevill et al. (2017) placed two professional Spanish referees into one of three rooms: a room with 16 Atletico Madrid supporters, a room with 16 Real Madrid supporters, or a room with no supporters. The supporters were placed 1m behind the officials while a live broadcast of the 2016 Champions League final between Atletico Madrid and Real Madrid was shown and referees were asked to decide whether they agreed or disagreed with the on-field decisions within two-seconds of the decision being made. Their judgements were shown to the fans via a green light if they agreed and a red light if they disagreed. The referees were less likely to disagree with the on-field decision when watching in the presence of supporters, and, in four key match incidents, the referees' judgment was influenced by the supporters present, suggesting a 'home-bias'. One explanation for these findings was 'avoidance', suggesting that, when faced with a difficult decision, there is a tendency to avoid making an unpopular one, which is con-

sistent with the data reported by Neil et al. (2013). Such studies show increased awareness of the importance of contextual factors in officiating performance.

Theories of representative design (Brunswik, 1955; Pinder et al., 2011), affective design (Headrick et al., 2015) and accompanying research, which has reported how perception and behaviour are affected by environmental and contextual constraints, mean that to inform future research and practice in football match officials it is important to gain a rich insight into the factors that affect performance. An approach that would contribute such information is the collection of experiential knowledge regarding factors affecting football match official performance. To date, investigations into officials have typically been quantitative in nature, and so there is a relative lack of understanding regarding the first-hand experiences of match officials, which could be addressed through qualitative investigation (Gorzcynski & Webb, 2020; Hancock et al., 2021). A qualitative methodology with an elite population is warranted to complement existing research with non-elite referees which identified contextual influences on decision-making performance (e.g., previous errors, confrontation and player reputation; see Neil et al., 2013). Utilising the experiences of elite performers to gather knowledge, with the potential to inform practice design and training methods, is becoming increasingly valued in high-performance organisations (see Woods et al., 2020). Such experiential knowledge has been used to identify both individual and environmental constraints that impact sport performance (Pocock et al., 2020) and highlights the importance of the relationship between the performer and the environment.

Given the interaction of multiple constraints on performance and the value of experiential knowledge gathered from elite performers themselves to provide such rich insight in this area, this study collected experiential knowledge from elite football match officials to identify the factors, both individual and environmental, that affect performance. Given the focus on quantitative and reductionist methods when investigating officials' performance, this study sought to address the limitations associated with such approaches and provide a more holistic insight to the performance of elite football match officials.

Methodology

Participants

Three male professional football officials participated in the study (*M age* = 45.3, *SD* = 6.65). To preserve anonymity, age and specific competition

involvement are not reported, however all were currently officiating in their home nation's top-flight division and had experience of officiating at the FIFA World Cup, UEFA Champions League, and UEFA Europa League. The total experience as a professional match official across the participants was 61 years (M = 20.3 years, SD = 2.49).

Data Collection

Ethical approval was granted by the ethics committee at the lead researcher's university. Prior to commencing the study, invitation letters, information sheets, and consent forms were sent to four prospective participants, with three electing to participate. Interviews were conducted over Zoom (Zoom Video Communications Inc, California, USA) due to geographical constraints and avoiding unnecessary social contact in the context of COVID-19.

Interview guides were constructed using the template proposed by Rubin and Rubin (1995). This guide consists of seven stages and features: creating a natural environment (e.g., 'Are you having a good week?'), encouraging conversational competence (e.g., 'What do you find are the biggest challenges facing officials in the modern game?'), showing understanding (e.g., 'Yes, I can see why you would say that'), getting facts and basic descriptions (e.g., 'Can you tell me how you prepare for a game?'), asking key and difficult questions (e.g., 'What does criticism look like to you and how does it make you feel?'), toning down the emotional level (e.g., 'Do you think your views are shared by other referees?') and closing whilst maintaining contact ('Is there anything about these themes that you'd like to ask?')[1]. Questions were designed to explore the emotions and experiences of elite officials in situations that have been addressed in traditional, quantitative research and modern developments in elite level officiating.

Pilot Study

A pilot study was conducted to achieve two ends: first, to further develop the experience of the author which is imperative in qualitative research (Keats, 2000). Second, to assess the relevance of the questions in relation to the aim of the study (Denzin & Lincoln, 2011). The pilot study was conduct-

[1]Interview guide is available from the lead author upon request.

ed with a professional Rugby Union referee. The referee was male, with eight years' experience. Although the focus of this study was football officiating, access to elite referees is rare and therefore using a potential participant in the pilot was avoided to preserve sample size. Additionally, many of the issues faced by football officials (e.g., the use of technology and the affective impact of crowds and previous decisions) are also present in Rugby Union, a ball-and-territory game of cultural significance in Europe. The interview was recorded via Panopto (Washington, USA) and Dictaphone (Maozua 8GB Professional), then transcribed within one week of the interview. The transcript was sent to the participant to improve social validity of the interview and establish credibility. Credibility is an important part of confirmability, a qualitative alternative to reliability and validity, and is established when credibility, dependability and transferability are met (Lincoln & Guba, 1985). Dependability was met by clear documentation of the process, which readers can examine in this section, and to establish transferability a clear and detailed report was produced to enable transfer of data across participants and support confirmability (Tobin & Begley, 2004).

Close examination of the pilot interview led to changes in the interview structure and style. Regarding structure, most notably the topic of feelings pre- and post-game was introduced as they were deemed significant by the participant. Regarding style, the use of probes was increased to try to gain more clarity from responses (e.g., 'That's interesting, could you tell me more?' and 'So you mean [interpretation], have I understood this correctly?'; Keats, 2000). This approach enabled a semi-structured interview to occur, allowing the participants to both respond to questions and lead the discussion, prompting openness and justifying the use of interviews over questionnaires to achieve a richer data set (Biddle et al., 2001). After the necessary modifications were made, interviews with the three professional football officials were conducted during the summer off-season.

Interviews

As interviews took place via Zoom, participants could choose a familiar setting with no distractions and therefore no consideration was needed as to how to make their surroundings more comfortable to promote honest responses (Keats, 2000). Prior to each interview, a standardised briefing was read to each participant that reinforced protection of anonymity, including the changing of team names for specific matches if necessary. Participants were asked to answer honestly and reassured that there were no right or

wrong answers to encourage open responses (Gillham, 2000). Each interview lasted approximately 75 minutes (M = 78.7 minutes, SD = 12.9) and transcripts were sent to participants to improve confirmability (Lincoln & Guba, 1985).

Data Analysis

Thematic analysis was chosen as the method of analysis as it enables a detailed description of context in the report, promoting confirmability (Tobin & Begley, 2004). Braun and Clarke (2006) also advocate thematic analysis as it allows for a detailed report due to its flexibility. While thematic analysis has not experienced the same appreciation as Grounded Theory (Glaser & Strauss, 1967), the latter approach is traditionally used to construct new frameworks (Willig, 2013) and was therefore not suitable for an area that has experienced a recent spike in research activity (Hancock et al., 2021; Kittel et al., 2019).

A critique of thematic analysis has been that methods are not suitably transparent, regarding both interpretation of the data and how analysis was conducted (Nowell et al., 2017). To interpret the data, a two-stage reflexive analysis (Braun & Clarke, 2006) was adopted, previously identified as vital for identifying, and reflecting on, assumptions drawn from data (Braun & Clarke, 2019). Consequently, neither an inductive (e.g., a 'bottom-up' approach moving from the specific to the general with no pre-determined structure) nor deductive (e.g., a 'top-down' approach utilising an existing structure) stance was adopted. This afforded researchers the ability to move iteratively between either approach, guided by a six-stage process of analysis (Nowell et al., 2017). The first stage was familiarisation with the data. Transcripts were read twice, with meaning units suggested if appropriate on the second reading. These meaning units were put into an Excel (version 16, Microsoft, Washington, USA) spreadsheet for clarity. The second stage was generating initial codes, where a coding framework was established using the raw data in the spreadsheet. Additionally, a reflexive journal was used to chart coding, contributing to transparency and acknowledging recommendations that qualitative researchers need to reflect upon experience to improve their method (Kidd, 2002; Walker & Myrick, 2006). The third stage, searching for themes, utilised another researcher to triangulate themes and construct a diagram to link identified themes where possible. These themes were reviewed in the fourth stage, with peers omitting themes if disputed. In such cases, referential adequacy was tested by returning to the raw data.

Completion of this stage led to defining themes, the penultimate stage of the process. Meetings to establish such themes were documented, with the use of diagrams where possible (e.g., thematic maps; Figure 1). One outcome of such a meeting was the interpretation of contextual constraints on performance occurring at different levels (e.g., proximal and distal) and interacting with one another. Bronfenbrenner's (1979) ecological systems model (see Figure 2) was therefore applied following inductive analyses as it represented a meaningful heuristic to reflect the multilevel nature of the referees' experiences. Following the completion of Figure 2, the report was produced.

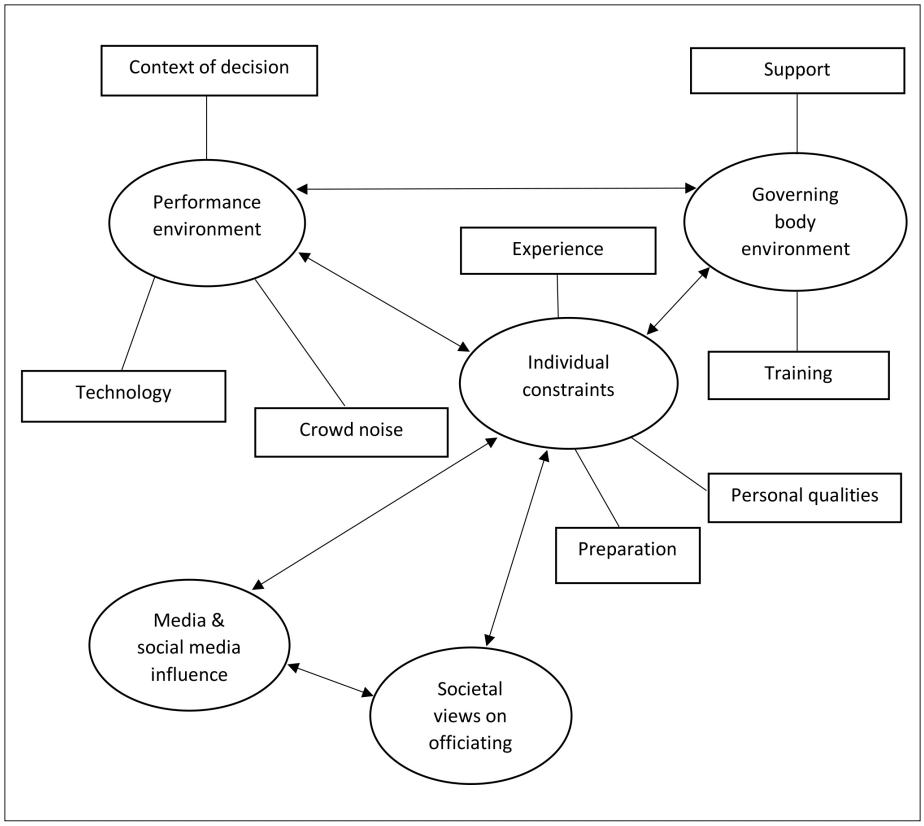

Fig. 1. - Thematic map of lower and higher order themes identifying contextual constraints on the performance of elite match officials.

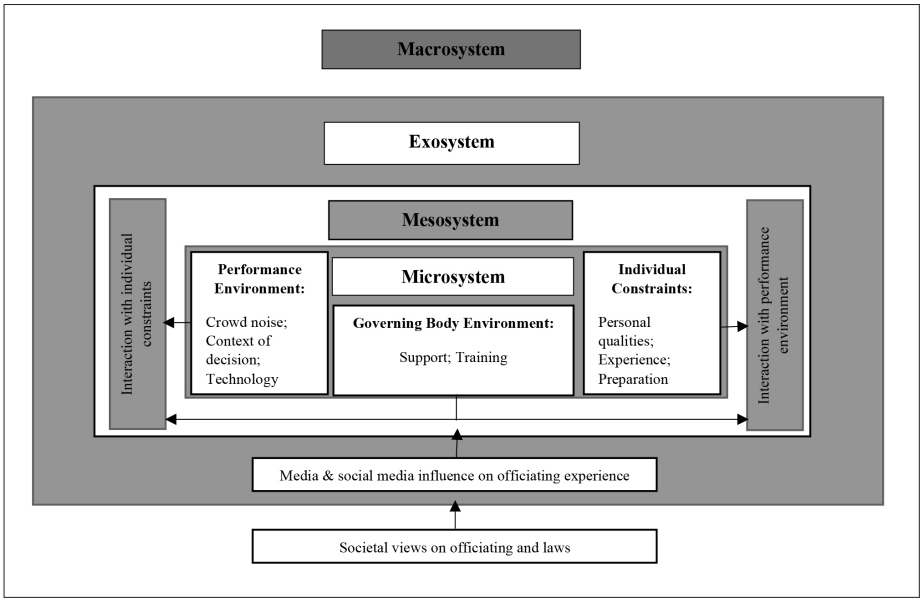

Fig. 2. - Conceptual model of themes and their ecological system that contribute to the performance of elite football officials.

Results and Discussion

The thematic analysis identified eight lower order themes, which were categorised into five higher order themes: performance environment, governing body environment, individual constraints, media and social media influence, and societal views (Figure 1). Each higher order theme was placed in an ecological system (Figure 2). Each ecological system was categorised as either a proximal constraint (microsystem and mesosystem) or distal constraint (exosystem and macrosystem).

Proximal Constraints: Microsystem and Mesosystem

Three higher order themes, identified as the performance environment, governing body environment and individual constraints, are placed within the microsystem, defined as the immediate environments an individual interacts in (Onwuegbuzie, Collins & Frels, 2013).

Performance environment

Within the performance environment, defined as the arena in which an official operates, crowd presence was identified as a contextual factor that influenced performance. Frank, when commenting on officiating in stadiums with no crowd (due to the COVID-19 pandemic) stated:

> *"The atmosphere wasn't the same….believe me, it is very hard to find the concentration, and in my opinion the top players and a top referee have more problems than others [when performing without a crowd present] because we like to stay under pressure."*

This quote suggests that, for elite officials, crowds can enhance performance. However, this view was not shared by Mark, who claimed:

> *"The one big difference without a crowd when we returned was that the games were a lot easier to officiate…without having the fans and the pressures that can bring. But I noticed it actually affected player behaviour as well…they were not feigning injury so much, they were not trying to 'win' fouls so much…and the managers as well."*

Identification of benefitting from perceived pressure and improved player and coach behaviours provides greater insight than previous investigation of crowd impact on officiating performance that has typically been observational in nature (e.g., see Nevill, Balmer & Williams, 2002; Sutter & Kocher, 2004). The experiential knowledge collected in this study offers insight into the mechanisms that might explain this influence. For instance, if players are persistently attempting to 'win' free-kicks as a result of audience presence, this may not only assist in prompting the concentration Frank suggested is missing when spectators are absent, but also increase the social pressure on the official to appease the crowd, as Mark suggested:

> *"I think if the referee is giving free-kicks, and the home crowd, if it goes against the home team, will often vocally show their displeasure. Then if there's another free-kick against the home team it [pressure] builds and build and builds. I liken it to a cricket match and there's an LBW appeal and the umpire says 'no', then there's another LBW appeal in the same over and the umpire says 'no' again. Then the players are getting a little bit fractious and the crowd are too…then the third appeal might be 'no' again but sooner or later you would think that pressure will build to the point of he's wanting to show he's [sic] fair minded."*

The recognition by officials that crowd pressure may result in them being unable to mediate the emotional effects of their environment, with subsequent impact on decision-making, relates to the concept of allostatic load (McEwen & Steller, 1993; Ogden, 2004) - essentially psychological 'wear and tear.' Alternatively, Mark's observation can be interpreted through the idea of 'social payoff' (i.e., the avoidance of criticism) resulting from one's decisions

(Dohmen & Sauermann, 2016). Incorporating methods or practice environments that expose officials to such pressures or challenging environments in their development may prove beneficial in assisting them to cultivate resilience in these situations. For instance, Oudejans and Pijpers (2009) coupled the physical demands of scoring a basketball free throw with induced anxiety by informing participants that their attempts would be recorded, watched and evaluated. The experimental group who had been exposed to these conditions maintained their performance when progressing from low to high pressure tasks, whereas the control group who practised in the absence of this emotional manipulation subsequently suffered a deterioration in performance in high pressure environments. Inducing anxiety through social evaluation has also been applied to football players to successfully enhance decision-making performance under pressure (see Kent et al., 2021), supporting the view that decision-making in officials could benefit from representative practice designs which represent these pressures.

Frank explained other ways in which the crowd can influence decision-making of officials:

> *"If there is a yellow card, a clear yellow card, sometimes the referee cannot see everything 100%. Sometimes the reaction of the people, the spectators, can support you for this sort of yellow card, because all the other people think the same. You can do the same, for example, like a penalty in the box, sometimes the atmosphere around can support the good decision."*

Rather than the impact of the crowd being attributed to social influence, this alternative explanation outlines how officials utilise cues and surrounding contextual information to support decision-making when they lack access to other relevant information. Such a strategy has been shown to be employed by skilled performers in tennis (Murphy et al., 2016; Murphy, Jackson, & Williams, 2018), cricket (Runswick et al., 2018a; 2018b), handball (Helm et al., 2020), and baseball (Gray & Cañal-Bruland, 2018), however this is the first time that research has provided examples of experiential knowledge that elite match officials make use of contextual information outside of player action to inform their decision-making.

The importance of contextual information is often neglected when considering the development of officials (and has been largely overlooked in sports performance more generally, see Cañal-Bruland and Mann, 2015). However, the impact of previous actions within the performance environment, which has been shown to affect decision-making (see Plessner & Betsch, 2001), was acknowledge by Mark who stated:

> *"When you've made a crucial decision that turns out to be wrong, that next sixty seconds of refocussing the mind, of 'parking the decision' and forgetting about that decision and going*

onto the next one is fundamental. So that's one of the psychological sessions that we worked on last year that's been a big help to me and a lot of my colleagues, that notion of 'parking the decision' is important, and then to move on."

Frank echoed this sentiment:

"[after a mistake in the first two minutes] It's very important to be able to do the next 88 minutes with the same ego. Because in another case you go down, down, down, down…" Consequently, earlier performance may negatively impact subsequence performance and decisions, so practice and training must not treat decision-making as discrete isolated incidents.

In addition to the impact of previous decisions, David identified the significance of the decision on the outcome of the game and the time of the decision in the game as contextual influences: "A penalty is an important decision. It's a key decision…The more you arrive at the end of the game the more you need that decision that you can take to be clear. Especially about the consequences." The significance of the action has also been shown to impact performance in players. For instance, rugby players were shown to have significantly lower kicking accuracy when the margin between teams was 2 points or less (Pocock et al., 2020), indicating that officials experience similar contextual constraints to players. Frank believed considering the consequences of a decision impairs accuracy: "A good referee, he [sic] don't think. Ever… When I see [a] situation I don't think. It's just 'foul or no foul? Decide.' No other way. I don't think because if you think about the time or the result you cannot do this."

A recent addition to the performance environment of officials is the introduction of technology. The use of technology (e.g., microphones, introduced at the 2006 FIFA World Cup, and the video assistant referee, VAR, trialled in 2016 and first used at the 2018 FIFA World Cup) was identified as a key feature within the performance environment of elite officials and was unanimously commented on favourably by the officials. This positive appraisal was attributed to VAR having a positive impact on player behaviour, particularly regarding reactions to decisions, helping to make the decision-making process easier and more accurate. For instance, Frank stated:

"Because they [the players] are more happy, because they are sure that the majority of the decisions will be correct. So, for example, it is very difficult to have an incorrect goal because we have offsides that are very close to the 100% correct decision. So, a player in the field they want to have the good decision and with this system the majority of the decisions are good. With this target, it [VAR] is good."

David echoed this view by stating, "VAR is a fantastic and positive aspect for football because it's limited the big mistakes and at the end it's difficult for

a team to fight…it's difficult to accept to lose." This implies that the VAR aids performance because it helps an official 'sell' a decision, a quality stated as vital for performance by Frank: "Selling the decision is very important. If you sell the decision very well people accept every time." Consequently, training could also focus on how a decision is communicated rather than just the decision itself.

Despite the overall positive evaluation of technology as a feature of the environment, David expressed some caution surrounding its use to enhance performance:

> *"[Technology] Definitely helps us in our job. But when you implement something there is not just the positive aspect. You can have a negative aspect. The target is to limit the negative aspect just to stay on the positive aspect…because for sure we have now the possibility to speak now very fast and very clearly with the teammates but, on the contrary, if you speak too much you lose some elements."*

Consistent with this observation regarding how to avoid negative aspects of technology use, MacMahon and Mildenhall (2012), have recommended that training with technology is imperative to improve on-field decision-making in match officials. Therefore, a focus on interpersonal skills involving the use of technological aids may be a more effective approach for elite officials than traditional methods that focus on the decision-making of an individual in isolation, with such training being delivered by the governing bodies responsible for referee development.

Governing Body Environment

Elite match officials operate under the guidance of governing bodies, whose support was identified as important for performance in the form of training and development. Frank indicated satisfaction with the physical training provided by UEFA, for example: "UEFA is very strong and I think they are good in a 100% way. And we have [name of trainer] who is a great coach and this is very correct because without a good physical condition you cannot referee at this kind of level."

The importance of physical conditioning is not only evident because of the increased pace of elite football and impact on decision-making (Mallo et al., 2012), but also for promoting acceptance of decisions and the authority of the official (Simmons, 2011). In essence, officials that are in good physical condition are not only better equipped to make decisions, but have their decisions accepted more readily.

Although physical training was considered important for performance by elite officials, training in psychological aspects related to performance

was an area that was identified as lacking. When asked about psychological factors related to performance, David commented: "I don't have many opportunities to talk about the cognitive aspect of my work. And I like it!" Frank also identified a training bias towards the physical and technical over the psychological:

> *"We have only physical part about the training session because we only have a physical training session. We have schedules for that. But for mental preparation we have…alone preparation…private preparation because every referee decides with himself (sic) if (they) do this type of mental preparation or not. For example, I work with many, many hours with this in the past because I think it is very important. When you prepare very well it is very important."*

Despite officials recognising psychological training as a valuable and 'key aspect' of their performance, it was apparent that it receives less attention than other aspects of performance. While the range of psychological skills training is broad, psychological training in referees should extend beyond the traditional 'canon' of psychological skills training in sport, identified as relaxation, self-talk, imagery, goal setting and concentration (Anderson, 2009). For instance, concepts couched within social psychology such as group process have been identified as beneficial to sports officials (Hancock et al., 2018). Specifically, when asked if psychological training should be mandatory for officials, Frank replied: "It should be…I hope in the future they introduce this type of person [psychologists] because I think it's one of the secrets of a referee to have a freedom of worry." This quote suggests approaches to minimise the impact of pressure would benefit decision-making in referees, endorsing representative practice design and previous suggestions for psychological skills training in this area (see Webb, 2017).

Individual Constraints

Individual constraints relate to factors and qualities specific to the individual which were considered important in affecting performance of officials. For instance, David identified an ability to control emotions as important for officials: "The target for the referee is to have emotions but to control them". Anger has been identified as an emotion that damages the credibility of an official (Simmons, 2011), with Mark stating that when this emotion cannot be regulated, resilience is a quality required to improve performance:

> *"If you get angry or if you have a heightened state of emotion, I don't think you're in the mindset to make the next decision. So, let's say you've got a penalty wrong or an offside goal wrong…you need a strong character, or a strong resilience, to overcome that."*

This quote supports the development of resilience in match officials, which has been associated with specific traits. For instance, being proactive and a willingness to take control have been identified as personality characteristics that are antecedents to resilience in sports performers (see Fletcher & Sarkar, 2016), which was also recognised by David:

> *"…we (referees) take responsibility, for sure. We take decisions. To be number one. You know? Yeah, for sure, be in control, sure. To be in control. Probably all the referees like, or need, to be in control. Because it's quite difficult to make decisions if you're not in control."*

To facilitate feelings of control, David revealed that individual preparation was important: "I'm convinced that if I am very well prepared…I have all the tools to control the situation to take the correct decisions. To take decisions, take responsibility, stay in control." Albeit with players, preparation has been shown to improve decision-making in elite-football (Horrocks et al., 2016), therefore training that includes pre-performance preparation may be just as beneficial to performance as decision-making exercises.

The interaction of contextual constraints found within the microsystem is categorised as the mesosystem (Bronfenbrenner, 1979). Officials revealed that interaction between these constraints occurs, mediating their impact. When asked if the importance of the decision influences decision-making, Mark identified that personal characteristics impact this element of the performance environment: "If I'm being totally candid, this may happen with some referees, but those referees are the ones without the strength of character or…who don't want to be the person who relegates a team, for example." This quote provides support for the concept of avoidance: when officials take a course of action to avoid negative social appraisal (Nevill et al., 2017).

Other themes related to the individual environment, such as experience, also had an impact on how technology (a theme from the performance environment) affects performance, with David stating:

> *"My reaction [to VAR intervention] now is very different to that at the beginning of my experiences. Because, definitely, at the beginning of the experiences when I saw the mistake or I receive information from the VAR that I am wrong, I say 'shit', 'shit'. I said, "the technology is better than me and I don't like it." I don't like it. But, now, it's very different. Because now it's more a friend. OK, I receive the information and, OK, I am wrong. No problem. This is natural. OK, at the end of the game, I was not happy. But in the game, it's not a problem to overrule my decision. OK, I am not happy at the end because I would like to be perfect but the relations I have with the VAR now is more friendly than the relations I have had in the past."*

Experience, and how governing bodies need to understand its importance, also mediates the impact of the crowd according to Mark:

> *"It's interesting because if you're appointing a new referee and he [sic] has his first match or maybe his third of fourth match in the [European top-flight league] I would never put him [sic] on that far side at [team name]. Never, ever. He [sic] would have to do two or three years before I would put them at [team name] or [team name] and yet, back in the day, you'd often find their first game was at the far side at [team name]. Thankfully, the person appointing the match officials is an ex-assistant referee in the [European top-flight league] who understands these things."*

Identification of referee experience as a constraint on performance is consistent with the concept of social facilitation (Bond & Titus, 1983; Zajonc, 1965) which posit that tasks performed under social pressure are enhanced only if they are well learned. Thus, utilising this example of experiential knowledge, practice design must aim to reduce the deleterious impact of social pressure and governing bodies must therefore be aware of individual differences (such as experience) and consider how this may act as a constraint on performance (e.g., appointments at certain grounds or fixtures).

Distal Constraints: Exosystem And Macrosystem

Previous research has acknowledged how factors detached from the performance environment can affect match officials, such as the identification of societal factors on welfare (Webb et al., 2021). Such factors were identified by the officials as having (or having the potential to have) an impact on performance and are located in either the exosystem (a setting that does not involve the individual as an active participant but affects them anyway; Bronfenbrenner, 1979) and macrosystem (the consistencies found at the level of culture as a whole; ibid, 1979). For instance, although practicing officials have no direct contact with the media, it was suggested that should officials consider the review of the media it can potentially influence their performance. This was revealed by David who, when reflecting on a significant decision he made, stated:

> *"I have grown up in the last ten years because ten years ago I ask too many questions before taking this decision. Now, I take the decision. As I told you, I don't care [about reaction from the media]. In the past…, I was probably more impacted by…commentators, but not now. And now, I change my strategy for the media. Now I don't read this kind of feedback. I don't watch the TV…I don't want to hear the radio. I don't go on Facebook or Twitter. I can't."*

Such strategies utilised by experienced officials to minimise the impact of the media strengthens the importance of sharing experiential knowledge to enhance coping ability (see Evans & Baker, 2020). Additionally, the use of cognitive behavioural techniques to minimise the emotional and behavioural

consequences of adverse events, such as media criticism, may be advantageous for officials (see Dryden & Branch, 2008; Turner & Bennett, 2018).

Mark believed that a consistent cultural dislike for authority is reflected in the media, helping him to rationalise criticism:

> *"The way I cope with it is that if the media or the players, the manager or anybody criticising…is that they're not criticising the person, they're criticising the authority figure. A bit like criticising a traffic warden or a tax inspector, I suppose."*

Regional, as well as national, characteristics were also identified as influencing performance. When asked if the environment a referee develops in impacts performance, David revealed:

> *"Yeah, for sure. You know, in France, ten years ago in the top division there was a lot of referees who come from Marseille, or the region of Marseille in the south, and the referees are from the region of Paris because, at the moment, the competition, it matters. The competitions in Paris or Marseille are the worst in France. This is the most difficult game to referee…because the behaviour of the people is very bad. You have to take decisions in front of [a] difficult environment and learning [to referee] in Marseille or Paris, you grow up faster. It is absolutely natural. It means that the other elements that you live have an impact about the performance or the career."*

Geographical impact on official development is not only significant in other European leagues (of the 19 referees involved in Premier League games during the 2020/21 season in England, only 2 were from southern counties) but is believed by David to influence performance because challenges regarding behaviour, and the experienced acquired as a result, are more prominent in some regions than others.

Experience was a theme that David identified as the most important quality for elite officiating performance, stating:

> *"You can select maybe a situation, maybe ten… type of situation, and this is always the same situation that you have to decide. The problem, no the fact, is that when you start your box is empty. And game after game, months after months, seasons after seasons, you put some feedback into all these ten boxes so after you have many memories."*

The importance of experience in officiating performance shown in the observation by David underlines the necessity of developing representative practice to meet FIFA's aim of consistent decision-making.

Recommendations for Practice design

Experiential knowledge gathered in this study, which has highlighted the importance of contextual and environmental information to performance

of officials, prompts two main recommendations for practice design to enhance the performance of elite football referees. The first is that proximal constraints (e.g., crowd noise, context of decisions) are sampled and incorporated within their training programmes to ensure sufficient task functionality of the learning environment. To achieve this, there are practical limitations to consider as some of the constraints that were identified as affecting performance could prove challenging to represent. Player behaviour, for example, was identified as a constraint on performance, and yet this is challenging to replicate authentically. Where availability of resources necessitates the use of video-training methods there is scope that these could be developed to better integrate contextual information. For instance, instead of presenting decision-making scenarios in isolation of one another, a series of decisions could be shown in sequence to capture the impact of sequential context effects (McRobert et al., 2011; Plessner & Betsch, 2001). While this approach has been utilised (see Samuel et al., 2019), it is unclear at present as to whether consistent training using this method improves decision-making accuracy. Utilising sequential scenarios could also be coupled with other contextual factors such as the presence of a crowd (see Nevill et al., 2017). The presence of a crowd is also likely to invoke emotional responses and ensure that the practice context not only reflects the functionality of the performance environment as per the principle of representative learning design (Pinder et al., 2011), but also captures the affective and emotional responses (cf. Headrick et al., 2015).

A second recommendation is that training incorporates strategies for dealing with pressure and negative social evaluation, identified as a significant factor in decision-making inconsistency (Dohmen & Sauermann, 2016; Nevill et al., 2017; Page & Page, 2010). A prospective approach is to utilise cognitive-behavioural workshops for officials, with one potential angle for such workshops being the application of rational-emotive behaviour therapy (REBT; Ellis, 1957) which is being increasingly applied in sporting contexts (see Turner & Bennett, 2018). A recent REBT intervention with rugby union match officials showed a subsequent reduction in performance related anxiety and reported decision reinvestment (Maxwell-Keys, Wood & Turner, 2022), which suggests it may prove similarly beneficial for officials in football.

Conclusion

This study has provided insight to the constraints affecting performance of match officials by collecting experiential knowledge of highly experienced

football match officials operating at the highest level in their profession, with associated implications for training and development programmes. The efficacy of traditional video-based training interventions (e.g., see Samuel et al., 2019; Spitz et al., 2018) is called in to doubt by the findings presented in this study as such techniques fail to capture the contextual information and environmental constraints that were recognised as affecting performance from the officials' experiential knowledge accounts. The importance of these informational constraints on performance suggests that development pathways for match officials seek to ensure such constraints are sampled and incorporated within their training programmes, alongside exploration of strategies to minimise the impact of social pressure on elite match officials. These recommendations seek to ensure sufficient task functionality of the learning environment, which is consistent with the tenets of the theory of Representative Learning Design (cf. Pinder et al., 2011).

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