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Perceptual & Motor Skills: Motor Skills & Ergonomics

A SITUATED ANALYSIS OF FOOTBALL GOALKEEPERS’ EXPERIENCES IN CRITICAL GAME SITUATIONS

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Summary.—This study described elite football (soccer) goalkeepers’ activity and performance in critical game situations. The 11 best French players (Mage = 15.5 yr., SD = 0.5) participated in the study. Interviews focused on goalkeepers’ experiences were conducted to identify meaningful events involved in failed actions. Players formulated 23 critical game situations. Verbatim encoding using a thematic analysis indicated that four main categories (coming off the line, goal-line clearance, one-on-one, and diving) represented the most critical situations encountered during matches. The relations among experience and action, inner states, background, attention contents, and intentions were elucidated. The discussion is grounded on the properties of such critical game situations and their implications for improving goalkeepers’ performance.

Football goalkeepers have specific functions in a game: they are the first attackers and the last defenders. They often kick or throw the ball in bounds to other team members to start the action, and often are alone as the last defenders in their goals in front of attackers. While they are not fully and directly involved in collective actions on offense for the team, they are the final critical barrier to the opponent scoring goals, and thus winning or losing a match (Hazlewood, 1998). Because they have an isolated position during performance, their practice is very different from that of their teammates. They have to stop the ball kicked by an offensive player. Thus, the goalkeeper has to perform a coincidence-anticipation task in order to be on the ball trajectory (Belisle, 1963).

A wide variety of research has evaluated goalkeepers’ performance and their inner states, strategies, and actions. For example, the importance of concentration has been highlighted in studies showing the special attention needed by goalkeepers during shots (Panchuk & Vickers, 2006; Bakker, Oudejans, Binsch, & Van der Kamp, 2006; Binsch, Oudejans, 2006; Binsch, Oudejans, 2006).
Anxiety, stress, and arousal have also been found to be crucial to goalkeepers' performance. Robazza, Pellizzari, and Hanin (2004) also found that mental training strategies to optimize pre-competitive states improved goalkeepers' competitive performance. Relaxation and self-talk has also been found to improve goalkeepers' performance (Rogerson & Hrycaiko, 2002). Decision-making is critical to goalkeepers' performance. McMorris and Colenso (1996) found measures of reaction times and anticipation indicated that players were better at predicting horizontal shots than vertical ones. According to a perceptive plan, goalkeepers' activities require superior movement detection. Savelsbergh, Van der Kamp, Williams, and Ward (2005) investigated the visual search behaviors of expert football goalkeepers during simulated penalty kicks, showing that eye fixations on particular aspects of the shooter's body were associated with higher performance.

These studies identified particular psychological and cognitive aspects of football goalkeepers' tasks. But in these studies the activity of the athlete is not considered as a whole, so understanding of the processes involved in performance is fragmented. Little is known about how the component activities are associated within the goalkeeper's overall performance, as has been assessed in other sports (e.g., Sève, Saury, Theureau, & Durand, 2002; Hauw, Berthelot, & Durand, 2003; Sève, Ria, Poizat, Saury, & Durand, 2006; Adé, Poizat, Gal-Petitfaux, Toussaint, & Seifert, 2009). A situated activity approach was the framework used in these studies to consider the global psychological requirements in terms of the elements of performance (e.g., body, other players, physical tools). This situated framework focuses on the investigation of actions and their relations to the meanings of situations, as opposed to analytic processes (Robbins & Aydede, 2009). Since many researchers have claimed that environment, body, and mind work together, there is a need to develop methods that deal with the properties of activity (Clark, 1997; Robbins & Aydede, 2009). While isolating psychological processes, the situated activity approach considers and examines actions as holistic organizations that are autonomous, situation-sensitive, and emergent. In sport sciences, comprehensive reports of athletes' experiences in situations have been provided in table tennis, trampoline, sailing, etc. (e.g., Hauw & Durand, 2008; Briki, Den Hartigh, Hauw, & Gernigon, 2012). Knowledge concerning goalkeepers' inner worlds is sparse, despite the potential value of understanding such intrapersonal activity.

Many prior studies have focused on simulated sport situations, as it is difficult to study game situations in a holistic manner. In particular, studying behavioral and cognitive responses to critical, problematic, or unexpected situations can potentially reveal the underlying structure of the players' skills and strategies. Flanagan (1954) developed a critical incident
technique that was recognized as useful for the analysis of activity from the participant’s point of view. This technique has been used in various disciplines such as education (Griffin, 2003), nursing (e.g., Yonas, Aronson, Schaal, Eng, Hardy, & Jones, 2013), and sport (Hanton, Cropley, & Lee, 2009). One major advantage of this type of analysis is the ability to identify key elements during an activity, the meaningful events evoking the action. This technique, however, typically uses analyses of experiences in terms of positive or negative feelings, tracking how various situations were arising and unfolding. However, a variation of this technique could focus on broad individual experiences within critical situations to reveal how athletes interact with situations (Hauw & Durand, 2007). This method extends the coverage of investigation by considering not only positive or negative feelings but also what is happening in problematic situations. Situated meanings could be tracked in relation to these situations.

Research Goal. Goalkeepers’ activity was defined in relation to critical game situations during a match. The analysis focused on recalled experiences and responses to critical situations from interviews, in an attempt to evoke the personal details of how functional activity changes and is structured in those situations.

Method

Participants
Eleven male goalkeepers from the French national football-training centre volunteered to take part in the study. Sixteen-year-old football goalkeepers ($M_{age} = 15.5\text{yr.}, SD = 0.5$) were members of a national team selection with competitive playing experience of 5 years. Each player was observed by a recruitment consultant and was selected for his match performance over 2 years. They had one practice per day: two goalkeeper-specific practices and three others with the whole team per week. They played each weekend in a junior national championship. They were considered to be future national elite football goalkeepers and participated in national and international competitions over the duration of the study. Written consent was obtained from all parents of participants and local ethics committee approval was granted before the beginning of the interviews.

Measures
Data were collected in two steps with each participant through interviews led by the first author: (a) identification of typical critical game situations, (b) description of each critical game situation using descriptions developed from interviews. Each participant was asked to identify meaningful events involved in failed actions that had been difficult for him during their last match. These corresponded to “critical game situations.” Some players gave several examples of critical game situations from the same match.
Procedure

Elicitation interviews were performed for each critical situation identified, and lasted approximately an hour. The “elicitation interview” is an action-questioning interview. Created by Vermersch, born of a psycho-phenomenological approach, a situation is described action by action, searching for all implicit elements involved so that it accurately reflects the players’ experience (Vermersch, 1994, 2003; Maurel, 2009). To facilitate players’ descriptions, questions were formulated using the present tense, brief sentences, and verbs of action. The goal of this interview is to help the goalkeeper recreate past situations and actions and enable him to experience them again. After recalling an action, the participant was asked to describe what was happening at that time.

According to Vermersch (2009), elicitation interviews could be called retrospective introspection. The interviewer uses a non-inductive guidance of the experience formulation by trying to evoke past experiences by fragmenting time and actions in questioning. The interview responses reveal how participants had experienced the situations in relation to (a) actions, e.g., “What are you doing here?”, “What are you doing on your line?”; (b) feelings, e.g., “What are you feeling about this action?”; (c) intentions, e.g., “What are your intentions here?”, “What are you looking for?”; (d) thoughts, e.g., “What are you thinking about?”, What are you concerned with?; and (e) attention contents, e.g., “What can you see?”, “What can you perceive?” For each critical game situation, attention was focused on the specific moment defined by the player as the beginning of the action and how he acted during and all the way until the end of the action. During the interviews, interpretations and generalizations were avoided and specific attention was placed on the singularity of the situated experience, e.g., What is specific for you in this situation? (Vermersch, 1994, 2000, 2003; Theureau, 2006). In this way, it is possible to tap the goalkeepers’ recollections of their perceptions, feelings, and thoughts during their actions (Gouju, Vermersch, & Bouthier, 2007). The interview is not focused on the explanation of the critical situation, but rather on describing it.

Analysis

After transcription of the interviews, the data were analyzed in three steps. First, categories of critical game situations were developed. Second, encoding categories of experiences were developed for the most frequent critical situations. Finally, typical categories of experience for each critical game situation were identified.

Creating categories of critical game situations.—A label for each critical game situation was decided by selecting verbs of action during the participants’ reports corresponding to the main goalkeepers’ actions at that mo-
ment. For example, the following verbatim comment: “I am in the goal, I can see the offensive player arriving close to me, I am wondering whether I have to get out of the goal or not…. If I get out and if I am wrong, consequences are serious, you know… The goal is empty…” was categorized as “coming off the line.” It represents what goalkeepers have to do and the critical game situation considered (i.e., “I am afraid of doing something wrong”). Sometimes goalkeepers mentioned several critical situations from the same match.

Encoding categories of experiences for most frequent critical game situations.—During elicitation interviews, the players were asked to describe in depth their experiences in each critical game situation. The verbatim of the elicitation interviews was encoded using categories of situated experiences used in previous research (e.g., Vermersch, Martinez, Marty, Maurel, & Faingold, 2003; Mouchet, 2005). Five main categories were used: (a) main topic, (b) actions, (c) attention contents, (d) background, and (e) inner states. The main topic corresponded to the goal the participant wanted to reach (e.g., “Currently I want to…,” “my main objective is to…,” “the most important for me currently is to….” The actions were the means used by participants to reach their goal or main topic. This category corresponded to motor actions on the pitch (e.g., “I am running faster…," “I am leaving my goal…”) and cognitive actions linked to the participant’s reflection (e.g., “I am currently telling myself that…,” “now I decide to…” ). The attention contents corresponded to the focus in relation to perceptions, the feeling of intuition (e.g., “I can see…,” “I know that he is about to kick the ball…,” “I feel that it is hard to…”). The background corresponded to the mobilized knowledge during the action (e.g., game logic, rules, strategies, and personal experiences). The background can be located in previous actions within the same game sequence or during match preparation (e.g., “I have to assess the ball trajectory”). The inner states corresponded to the participant’s emotion and to his body’s involvement during the match (e.g., “slowness,” “lack of energy,” “tension,” “I am worried that…,” or “I am pleased with...”).

Using a thematic analysis (Corbin & Strauss, 2008), frequencies of categories for each critical game situation mentioned by the goalkeepers was counted as follows. Frequencies of statements in each category were calculated for each critical situation and summed over participants. Then the critical situations were ranked according to the summed frequencies.

Identifying typical categories of experience for each critical game situation.—A search for typical categories of experience was performed as follows, in order to characterize the critical game situations in terms of the most representative elements of experiences in each of the five main categories (intentions, action, attention contents, background, and inner states). For each critical game situation, frequencies of statements classified into the
five categories of experience were summed over participants. Then these frequencies were ranked per category. This yielded a characteristic experiential profile for each category.

Reliability of the Data and Analysis

Two investigators analyzed material following the procedures recommended by Miles and Huberman (1994). Each investigator read the transcripts and individually encoded them following the three-step procedure described above. The reliability between judges was verified for each step. The agreement rate was 100% for the first step and 80% for the second and third steps. Discrepancies were discussed until agreed upon.

RESULTS

The results are presented in two parts: (a) identification and ranking of typical critical game situations encountered during matches by goalkeepers, and (b) descriptive profiles of goalkeepers’ experience of critical game situations.

Football Goalkeepers’ Critical Game Situations

Although players were asked to describe critical game situations experienced during their last match, a total of 23 critical situations were mentioned. Those 23 critical game situations were ranked into four typical critical situations: coming off the line, goal-line clearances, one-on-one, and diving were formulated as recurrent critical game situations for goalkeepers.

Coming off the line represented the main critical game situation for all goalkeepers and was mentioned by all goalkeepers. Goal-line clearance and one-on-one were also mentioned as recurrent critical situations for five of eleven players. Diving was reported only twice as a critical game situation. Other critical situations were mentioned only once, e.g., presence of supporters or communication with teammates, but were not included because they were not directly related to the players’ activities.

Description of Typical Categories of Goalkeepers’ Experiences in Critical Game Situations

A global descriptive profile of goalkeepers’ experiences in relation to their critical game situations is shown in Fig. 1. The results indicate that experiences related to actions, inner states, background, attention contents, and intentions had typical elements. Regarding actions, the typical descriptions were related to position (e.g., body, feet, or hands position), moving (e.g., placements and moves in the goal area, stability, dynamism, or speed), communication, timing, and observation (e.g., passive waiting). Regarding inner states: doubts, hesitations, fear of physical contact, of making decisions, not feeling strong or ready, lack of conviction, and precipitation were typical and were linked to a feeling of low self-confi-
dence and lack of aggressiveness (regarding coming off the line and goal-line clearance) as well as low concentration (for one-on-one). Concerning background, the elements reported were an inefficient preparation of action (e.g., position preparation in the goal and hands preparation), and the collection of information during the match (e.g., on ball trajectory, speed and depth of the ball, the defense teammates’ position, spatial and temporal marks) appeared to be the common features. Regarding attention, the main preoccupations mentioned involved information collected during the observation of the opponent players such as movement, position,
build, size, and looking where to pass the ball before their action. For intentions, the purpose to not miss the ball was systematically part of each critical game situation.

DISCUSSION

The intent of this study was to characterize goalkeepers’ typical experiences with relation to their self-chosen critical game situations. Results indicated that these situations could be clearly defined and documented by goalkeepers. They defined four critical game situations, which were ranked and identified as typical categories. These results could be analyzed as a form of perception of the game’s purpose grounded in practice, personal reflections, intentions, or activities aimed at enhancing the understanding of performance and interactions with teammates. They partly described what it means to “be a goalkeeper” in relation to the definition of critical game situations or difficulties experienced in a match. These meaningful elements reflected singular episodes of their goalkeeping careers. They did not have the same past experiences despite the homogeneity of the group of goalkeepers. However, they shared similar global experiences about what was difficult or had emotionally affected them; thus, what was identified represents common soccer cultural situations and experiences for expert goalkeepers (Bruner, 1991; Strayer, 2002). It also reflects the common problems at this level of performance: the participants were talented goalkeepers at a national training centre, but still in the process of development or learning. The analysis of critical game situation experiences reflected what were their “timing” competencies and difficulties, similarly described for elite trampolinists by Hauw and Durand (2007).

Results showed that these critical game situations were composed of three elements. The first element is embedded in the situation specificity and comprises improperly executed actions and hesitation, as well as a global form of insufficient timing involvement. This element indicates the importance of concentration or self-confidence. This result confirmed the general idea that sport performance or actions in general implies reaching a specific level of involvement such as focus, attention (Cox, 2012), being better situated, and “presence” in the world of action (Clark, 1997). The second element is the temporal delimitation of the beginning of the critical game situations. The collection of goalkeepers’ experiences described incomplete or insufficient observation of the meaningful components present in their environment. These results also support cognitive research on expertise indicating that performance is the result of processing relevant information (Williams & Davids, 1998). The third element is the projection towards a potential future. The goalkeepers described the experience of losing the ball or an expectation thereof. Once again, the experience
was embedded in a global feeling about the possible outcomes, giving meaning to the actual experience; this could be an example of Atance and O’Neill’s (2005) concept of episodic future thinking, defined as a projection of oneself into the future to pre-experience an event.

These results were similar to previous analyses of elite athletes’ situated experiences delineating typical and singular sequences of activity breakdowns that were meaningful during table tennis (Sève, et al., 2002), a succession of moves in trampoline (Hauw, et al., 2003; Hauw & Durand, 2004), or ski jumps (Hauw, Renault, & Durand, 2008). Additionally, a critical point to make is that the results observed in difficult situations during acrobatic performance (Hauw & Durand, 2007), for the analysis of negative momentum in sport (Briki, Den Hartigh, Hauw, & Gernigon, 2011; Briki, et al., 2012), or here in the critical game situations for goalkeepers, cannot be reduced to local cognitive or physical problems. They must be considered within a more global analysis that links all these cognitive, physical, bodily, and environmental elements. Only in the actual game situation would such problems occur.

**Coming Off the Line as the Main Critical Game Situation**

The results showed that coming off the line is a major critical game situation for goalkeepers. At that time, players move away from their area, so their emotional valence of the situation changes. The criticism part of this situation is first experienced as an emotional stance and appraisal (e.g., Damasio, 1994). The area they left led to the emergence of a risky zone of activity, which required psychological skills such as a high level of concentration, aggressiveness, or self-confidence, but also energetic motor actions (i.e., moving fast, being ready to go) and cognitive resources (i.e., short reaction time, good timing, fast information collection). This result supports research in risky situations showing that awareness is the major resource used to face these situations. For example, research on trampolining showed that elite athletes took into account the question of risk by developing specific organization of their activity that embedded two main concerns: ensuring the viability of the ongoing activity in terms of performance (meeting criteria) and preserving the safety of the activity (maintaining various forms and levels of supervision of the unfolding situation) (e.g., Hauw & Durand, 2004, 2007). In such elite sport situations, the activity is conducted with the hidden thought that there will be a much more difficult zone of defensive activity to cover in case of mistakes. These results add a new dimension for understanding the experience in these critical situations that corresponds to a form of projection into the future, i.e., present in the athletes’ mind at that very moment [i.e., Atance and O’Neil’s (2005) episodic future thinking]. For the goalkeepers, it would be as if they
gave the attackers the possibility to win by offering them a very favorable possibility to score a goal. Thus, the “being there” experience is tightly constrained by future possibilities (Clark, 1997).

In contrast, less highly ranked critical situations were goal-line clearance and one-on-one, followed by communication and diving. These results suggested that the safety zone of activity could be less fragile in these cases, and thus discrepancy emotions did not mark the experience (i.e., Damasio, 1994). The goalkeepers stayed in a more controlled area, closer to the line of their goals. The question of timing was posed differently—only depending on the situation as an outcome involving neither the ball nor the teammate. In these situations, the result is the outcome and the risk appraisal was low: there was no potentially favorable situation for attackers.

To sum up, the results demonstrated that critical game experiences in football are associated with a specific and meaningful situation represented by the distance to the goal line. Coming off the line could be contrasted with other critical situations in terms of the dilemma to solve: acting on at this moment or waiting. This result is similar to those observed in other sports such as in elite trampolining, where the experience is also linked to physical meaning—the height of the jump and the distance to the center of the trampoline (e.g., Hauw, et al., 2003)—or the moment when oars enter water in rowing (Sève, Nordez, Poizat, & Saury, 2013).

Limitations

From a methodological point of view, the difficulties and challenges of a retrospective design should be emphasized. The concrete cases used to frame the interviews and the interviewers’ continuous check of the goalkeeper’s descriptions mitigate these traditional limitations. Several limitations could be addressed regarding the possibility of capturing the entire experience using a single sequence of interviews. The goalkeeper’s experience is undoubtedly deeper than the examples collected in this research.

Several perspectives could be proposed such as multiple and online collection of information as formulated in the Experience Sampling Method (Csikszentmihalyi & Larson, 1983), or the Ecological Momentary Assessment (Stone & Shiffman, 1994). Other information could be also added to these data collections in relation to coaches’ experiences of the same situation and third-person analyses of performance (Varela & Shear, 1999).

Practical Implications

Three practical implications could be highlighted. First, the results showed the importance of taking into account mind or thoughts, actions, and context (by detailing their interactions and their dynamics) in order to understand critical game situations and, by extension, athletes’ activity during performance. Methodological tools such as elicitation interviews al-
ollowed the possibility to associate inner states and technical/tactical actions to personal experience (Gouju, et al., 2007). For performance analysis, the benefit is to provide elements that enhance and inform the work of coaches and psychological consultants with respect to athletes’ feelings. This approach was developed in France in the national football goalkeepers’ centre (Villemain, 2009), as has been done in other sports (e.g., Hauw, 2009).

Results showed that enhancing performance techniques should not be limited by sport psychologists to strictly mental skills. Because the activity emerged from the interaction of these different elements, one way to improve performance will be to help athletes organize more efficient processing of different information streams. Thus, training could be oriented not only on psychological skills (Robazza, et al., 2004), but also on the ways those various elements interact during a specific activity situation in collaboration with motor behavior, thoughts, and environmental assessment. According to the current results, accurate description of athlete experiences enables focus on more efficient interactions among aspects of response to a problem encountered by athletes.

The third consequence is linked to athletes’ training. Practice could comprise difficult or failure situations to help goalkeepers to develop resources or other competencies in such situations. Indeed, the constructive ergonomics approach (Falzon, 2013) proposes the “enabling environment” concept, the creation of an environment in which people can develop their full potential and lead productive, creative lives in accordance with their needs and interests. A study on polar context showed that the operators’ autonomy in seeking an acceptable solution enables them to develop new competencies (Villemain & Lémonie, 2014); thus, goalkeepers’ training must be taught in enabling game situations to develop players’ competencies in the activity in potential failure situations, as well as autonomy in seeking new action strategies specific to the critical game situations.

The practice can be understood neither as a comfortable one nor within the safe zone of activity. This preparation relies not only on the coach’s control, but also especially on players becoming aware of all components involved in the action and not only the technical aspects. The technical sphere cannot be dissociated from the players’ feelings, thoughts, and intentions during the action. This analysis may also help coaches define themes to develop programs of deliberate practice (Ericsson, Krampe, & Tesch-Römer, 1993).

REFERENCES


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