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# Referee cognition as it occurs: different kinds of judgment acts

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## ABSTRACT

Referee decision making is an emblematic example of complex cognition. We study it as it occurs during rugby matches. Using a head-mounted video, we help the referee during an interview to articulate what makes sense. This allows proposing an alternative perspective to classic decision making theory to describe referee activity.

## Keywords

Perception/action coupling, head mounted video recording, naturalistic approach, intuitive judgment, rugby referee cognition.

## 1. INTRODUCTION

Referee decision making is an emblematic example of complex cognition occurring in real-world context; this context has all the characteristics of the environment in which the NDM movement is interested in (Kahneman & Klein, 2009; Orasanu & Connolly, 1993). A referee has to cope with ill-structured problems, uncertain dynamic environments, ill-defined and competing goals, shifting conditions, time pressure, high stakes, multiple players and organizational constraints. So, refereeing is a case of NDM (Mascarenhas, Collins, Mortimer, & Morris, 2005), but it seems to be an extreme case for different reasons, some evoked by Mascarenhas *et al.*, and others at least as much important:

- (1) the referee makes decisions under intense scrutiny;
- (2) referee physical demands are intensive;
- (3) referee decision making occurs in an antagonistic environment –teams confront each others in order to win a match–: what is right for one team would be wrong for the other and players provide irrelevant cues such as feigning;
- (4) the referee has to react instantaneously: if he/she doesn't, it would be too late as play keeps running;
- (5) it is difficult to identify a decision moment for two reasons: first, not all decisions are visible, second, overall referee activity is deciding;

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(6) the referee is not called upon to solve a problem or to cope with a prior and external event, he/she participates in the event content to be assessed.

Although NDM provides a relevant frame in order to study referee decision making, very few studies are involved into this movement (Mascarenhas, Button, O'Hare, & Dicks, 2009; Mascarenhas, *et al.*, 2005). Most researches focus on heuristics and biases: visual input distorted perception, influence of uniforms' color or stereotypes, reputation bias, home bias, sequential effect (Mascarenhas, O'Hare, & Plessner, 2006; Plessner & Haar, 2006)... However, some research studies try to take into account the complexity of referee activity. Plessner *et al.* (2009) highlight that refereeing studies suppose embodied cognition perspective and focus on referee's ability to make decisions by assessing multiple features of the situation. In this way, what is usually considered as bias –for example crowd noise– could be used as an additional cue. The NDM movement radicalizes this orientation: “members of NDM community have an aversion to the word bias” (Kahneman & Klein, 2009, p 525) and do not compare human judgments between algorithm outcomes. They describe expert performance: “how people actually make decisions in real-world setting” (Klein, 2008, p456). In this way, there is a shift in the perspective to study refereeing: Referees do not only apply the rules; their judgments are active decision making processings; they have to sell the resulting decision to the players; they account for the context of the game (Mascarenhas, *et al.*, 2009; Mascarenhas, Collins, & Mortimer, 2002; Mascarenhas, *et al.*, 2005; Mascarenhas, *et al.*, 2006).

Although research on referee performance should consider a naturalistic environment (Mascarenhas, *et al.*, 2002), most of the investigations fail for two main reasons. Firstly, even if there isn't solely a reference to an application of the rules to a reality, the methodology is still normative: referee decision making processing is always evaluated according to judgment accuracy (Mascarenhas, *et al.*, 2009). Therefore, the research does not focus on referee decision making as it occurs, but refers to what it should be. Secondly, methodological procedures are based on decision making tasks about critical incidents in which referees have to decide if there is a foul or not and to award an appropriate sanction. These incidents are presented in brief

video sequences (few seconds) which already circumscribe particular events. Thus, the situation which has to be judged is a priori defined in time, space and perspective. The referee's attention is already focused on **an** event, while on the pitch - rather than with a succession or sequence of events - he has to cope with the game's continuous play. Consequently, part of the complexity of referee cognition is perhaps to construct what has to be judged. After all, as Mascarenhas does -but for different reasons from ours- (Mascarenhas, et al., 2006), we can say that referee cognition in real-world context has not ever been described.

## 2. PROPOSITION TO STUDY REFEREE COGNITION IN REAL-WORLD CONTEXT

Our purpose is precisely to study rugby referee cognition as it occurs. Like Klein (2008, p456), we conduct field research "to find out how people were able to make tough decisions" in their own real-world context. Refereeing should not be considered as a cold mental process, but as a complex practice. As firefighters who "saw themselves as acting and reacting" (Klein, 1993, p 139), referees do not only judge but act on the pitch. In order to understand what a referee really does during a match, we propose a novel perspective which does not distinguish acts from judgments. This perspective highlights perception-action coupling (Gibson, 1977). What makes instantaneously sense for the actor in situation depends on certain orientations in which cognitive, affective, motor spheres are inextricably linked (Canguilhem, 2008; Récopé, Lièvre, & Rix-Lièvre, 2010). Therefore, action and perceptive knowing cannot be separate: acts are embodied and spontaneous meanings (Merleau-Ponty, 1942). Like Klein, we consider that expert decision-making is based on tacit knowledge (Kahneman & Klein, 2009); we propose that it is as much a perceptive as an acting knowledge. In a pragmatic perspective, we have no more hypotheses on referee cognition, but start from what referee cognition and action produce. According to different propositions concerning a judge's activity (Perelman, 1990; Ricoeur, 1995), we focus on **judgment acts** which are defined as bodily or linguistic manifestations which show to players and impose upon them what is possible and conversely what is unacceptable during a match. Therefore, our purpose is to study what and how players' activities are making sense for the referee in order to understand what and how he shows something and imposes it.

In order to study how he spontaneously constructs, shows and imposes what is possible, three main points have to be taken into account. Firstly, as what makes sense is for the most part implicit, we have to help the referee to articulate it. Although, "the power the subject has to set sights on himself" (Merleau-Ponty, 1988, p408) establishes the possibilities the actor has to explicate his experience, the actor is not spontaneously able to bring it to light. "If the subject wants to be able to produce a description he first has to presentify the lived experience [...] to suspend his

usual way of doing things in order that what previously only existed "in act" now appears as object" (Vermersch, 1999, p36). If any actor is capable of reflection, it is not a position that is spontaneously adopted towards his/her own action; it must be encouraged by a method. This presupposes that each referee must be assisted in rendering explicit what makes sense for him during the course of the match. Secondly, the activity of a referee is a public one. It is impossible, therefore, to ask him about what is making sense during the match: we have to wait to the end. In this way, some methodologies use video "to assist the subject to recall important mental events" (Omodei & McLennan, 1994, p1412). During an interview, video recording allows the actor to relate to a particular lived-experience and to invite him to render explicit what is making sense for him throughout. It is important because practice and its knowledge are embedded in context. Thirdly, video is usually used by referees for auto-appraisings or external evaluations. Therefore, when watching the video, most of their discourse is about justification: they watch the match as a spectator or a supervisor. In order to overcome this problem, we propose like Omodei & McLennan (1994), another kind of video recording, a perspective closest to the referee's one during the match. Using this perspective during a video-stimulated recall enables "the subject to become psychologically *re-immersed* in the original situation" (Omodei, Wearing, & McLennan, 1997, p142). In order to distinguish this kind of self-confrontation interviews, we called it *subjective re situ* interviews (Rix-Lièvre, 2010; Rix & Biache, 2004; Rix & Lièvre, 2008).

## 3. METHOD

We have worked with seven experienced rugby referees. The investigations took place during official matches of French "Federal 1", a semi-professional Rugby championship (third French high-level Championship).

For each investigation,

- (1) the match was filmed from the stands,
- (2) the referee was equipped with a head-mounted camera to record a perspective close to his own subjective one in the situation (see Figure 1); this perspective was audio and video-recorded all along the match,



Figure 1: Perspective recorded by referee head-mounted camera

(3) after the match, a *subjective re situ* interview was realised in which the referee was asked to describe his activity, to tell the researcher what was important for him during his action. In doing this, we used the head-mounted video from the beginning of the match to foster “an experiential immersion” (Omodei, et al., 1997, p 142); there isn’t any sequence which points to a particular event but the aim is to return to what was salient for the referee all along the match.

Observational data and the referee’s verbalisations were then examined together in order to relate judgment act processings with both subjective and objective approaches.

#### 4. FINDINGS AND DISCUSSION

These investigations have produced data enabling the researcher to understand the cognitive dimensions of referee’s activity as it occurs *in situ*. From this material, three kinds of judgment acts were distinguished (Rix, 2005): act-judgment, fact-judgment, deliberate judgment. These are three different relations between the referee and the players’ actions, three manners to construct, to show, to impose what is possible and conversely what is unacceptable, and three kinds of ‘things’ imposed. A fact-judgment instantaneously shows a precise point of context in its relation to a rule, which appears perceptually evident. “Knock-on” tells the referee; he explicates *ex post* during the interview that there is knock-on, it is a pity, it was a good action, but there is knock-on. Fact and rule exist at the same time for the referee during the match. An act-judgment is a judicatory moment insofar as it builds itself progressively in the referee’s dynamic relation to the players’ acts. What the referee imposes does not exist autonomously in the game context, but results from referee and player interaction throughout a game moment. Referee, for example, tells one player “Move back, move back, move back”, the player doesn’t, the referee whistles and says: “I tell you, three times”. There is an offside position but it is not referred to as a fact, but to players activities flux. In these two cases, there isn’t any alternative evaluation, nor mental simulation: the referee hasn’t enough time to imagine the accuracy of his judgment act. These judgment acts are “intuitive judgment” (Kahneman & Klein, 2009, p519): there are spontaneous acts; what is imposed is necessary or evident for the referee. Unlike act-judgment and fact-judgment, the referee develops deliberate judgment when the game is stopped. In problematic contexts, the referee takes time to examine the events with more information. After a scrum, a little fighting begins but the referee had followed the ball; he perceives a problem and stops the play in order to ask his assistants what happens. His judgment act results, in this case, in the conscious reconstruction of a finished event. This decision making processing is close to the one describe by Pennington and Hastie: like a juror, the referee construts “a coherent story of what apparently has happened” (Lipshitz, 1993, p110).

The research assumes there is not only one recognition processing. Indeed, three kinds emerge, each corresponding to a kind of judgment act. The referee situation is constructed:

- instantaneously during continuing play as a precise fact which appears as a shared evidence;
  - throughout player activities flux during continuing play , as a necessity according to what is possible and conversely what is unacceptable for the referee;
  - as a critical event whose logic is reconstructed *ex post*
- Although this research informs what is recognized by the referee, it mainly highlights the way in which the referee constructs his own situation.

Even if we distinguish different judgment acts, they have some generic characteristics. These are neither passive reactions to an environmental configuration, nor a decision-tree framework. Every judgment act is descriptive and performative: descriptive insofar as a game moment is displayed in a particular manner; performative insofar as what he describes happens. Consequently, his description gives a direction to the game. Thus, every judgment act has several relations to game rules which is not a simple application. The referee’s activity could not still be considered as passive rule application to a peculiar context, but the referee co-constructs, with players, the match’s course, and the rules of the game establish this possibility.

Studying referee decision making activity in a real environment shows (1) it’s impossible to conceptually dissociate foul judgment from control of the game procedures; (2) referee NDM is not just decision processing, but an interactive activity.

Therefore, to understand referee cognition activity, the research in refereeing NDM has to focus on designing dynamic descriptive concepts which include together these different dimensions, as “judgment acts” do. But we have to notice that the referee’s NDM is not only characterized by judgment acts which are bodily observable displays. Indeed, as Helsen & Bultynck (2004) highlight, numerous referee decisions are non-observable. So, in order to study referee’s NDM, future research will also have to investigate the referee’s non-observable judgment activity.

#### 5. CONCLUSION

However, our research allows us to suggest some directions to referee training programs. Firstly, using head-mounted video recording during an *ex post* interview is a powerful tool of experience recall (Omodei, McLennan, 1994; Omodei, et al., 1997; Omodei, McLennan & Whitford 1998). Most of referees who have participated to this research highlight that the *re situ subjective* interview arouses reflective learning. Therefore, the methodology developed could be a first stage of a coaching method. Secondly, training programs have to be worked out in order to enhance referee deliberate practice (Mascarenhas, et al., 2005). The most important seems to train referees to construct what has to be imposed. For example, according



to his position, what makes sense for the referee is different, and the possibility and the way to impose it, is also different. Consequently, training programs should propose to the referee not only to judge, but especially to step in the play. In this way, simulation and virtual training environments have to be conceived.

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## 7. REFERENCES

- Canguilhem, G. (2008). *Knowledge of life*. New-York: Fordham University Press.
- Gibson, J. (1977). The theory of affordances In R. Shaw & J. Bransford (Eds.), *Perceiving, acting and knowing. Toward an ecological psychology* (pp. 67-82). Hillsdale, NJ: Lawrence Erlbaum Associates
- Helsen, W., & Bultynck, J.-B. (2004). Physical and perceptual-cognitive demands of top-class refereeing in association football. *Journal of Sports Sciences*, 22, 179-189.
- Kahneman, D., & Klein, G. (2009). Conditions for intuitive expertise. *American Psychologist*, 64(6), 515-526.
- Klein, G. (1993). A recognition-primed decision (RPD) model of rapid decision making. In G. Klein, J. Orasanu, R. Calderwood & C. Zsombok (Eds.), *Decision making in action: models and methods* (pp. 138-147). New Jersey, USA: Ablex Publishing Corporation.
- Klein, G. (2008). Naturalistic decision making. *Human Factors*, 50(3), 456-460.
- Lipshitz, R. (1993). Converging themes in the study of decision making in realistic settings. In G. Klein, J. Orasanu, R. Calderwood & C. Zsombok (Eds.), *Decision making in action: models and methods* (pp. 103-137). Norwood, New Jersey, USA: Ablex Publishing Corporation.
- Mascarenhas, R. D., Button, C., O'Hare, D., & Dicks, M. (2009). Physical performance and decision making in association football referees: A naturalistic study. *Open Sports Sciences*, 2(9), 1-9.
- Mascarenhas, R. D., Collins, D., & Mortimer, P. (2002). The Art of Reason versus the Exactness of Science in Elite Refereeing: Comments on Plessner and Betsch (2001). *Journal of Sport & Exercise Psychology*, 24, 328-333.
- Mascarenhas, R. D., Collins, D., Mortimer, P., & Morris, R. L. (2005). A Naturalistic Approach to Training Accurate and Coherent Decision Making in Rugby Union Referees. *The Sport Psychologist*, 19, 131-147.
- Mascarenhas, R. D., O'Hare, D., & Plessner, H. (2006). The Psychological and Performance Demands of Association Football Refereeing. *International Journal of Sport Psychology*, 37, 99-120.
- Merleau-Ponty, M. (1942). *La structure du comportement*. Paris: PUF.
- Merleau-Ponty, M. (1988). *Merleau-Ponty à la sorbonne. Résumé de cours 1949-1952*. Dijon-Quetigny: Cynara.
- Omodei, M., & McLennan, J. (1994). Studying complex decision making in natural settings : using a head-mounted video camera to study competitive orienteering. *Perceptual and motor skills*, 79(3), 1411-1425.
- Omodei, M., McLennan, J., & Whitford, P. (1998). Using a head-mounted video camera and two-stage replay to enhance orienteering performance. *International journal of sport psychology*, 29, 115-131.
- Omodei, M., Wearing, A., & McLennan, J. (1997). Head-mounted video recording: a methodology for studying naturalistic decision making. In R. Flin, E. Strub, E. Salas & L. Martin (Eds.), *Decision making under stress: emerging themes and applications* (pp. 137-146). Aldershot: Ashgate.
- Orasanu, J., & Connolly, T. (1995). The Reinvention of Decision Making. In G. Klein, J. Orasanu, R. Calderwood & C. Zsombok (Eds.), *Decision Making in Action: Models and Methods* (pp. 3-20). Norwood: Ablex Publishing Corporation.
- Perelman, C. (1990). *Ethique et Droit*. Bruxelles: Editions de l'Université de Bruxelles.
- Plessner, H., & Haar, T. (2006). Sports performance judgments from social cognitive perspective. *Psychology of sport and exercise*, 7, 55-575.
- Plessner, H., Schweizer, G., Brand, R., & O'Hara, D. (2009). A multiple-cue learning approach as the basis for understanding and improving soccer referee's decision making. *Progress in Brain Research*, 174, 151-158.
- Récopé, M., Lièvre, P., & Rix-Lièvre, G. (2010). The commitment of polar expedition members to a project: declared motivation or in situ mobilization. *Project Management Journal*, 41(3), 45-56.
- Ricoeur, P. (1995). *Le Juste*. Paris: Seuil.
- Rix, G. (2005). Typologie des actes de jugement de l'arbitre de rugby expérimenté. *Science et Motricité*, 56(3), 109-124.
- Rix, G., & Biache, M.-J. (2004). Enregistrement en perspective subjective située et entretien en re situ subjectif : une méthodologie de constitution de l'expérience. *Intellectica*, 38, 363-396.
- Rix, G., & Lièvre, P. (2008). Towards a codification of practical knowledge. *Knowledge Management Research and Practice*, 6, 225-2232.
- Rix-Lièvre, G. (2010). Différents modes de confrontation à des traces de sa propre activité. Entre convergences et spécificités. *Revue d'anthropologie des connaissances*, 4(2), 357-376.
- Vermersch, P. (1999). Introspection as practice. *Journal of consciousness studies*, 6(2-3), 17-42.