

What Makes Basketball Players Continue with the Planned Play or Change It? A Case Study of the Relationships between Sense-making and Decision-making

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ABSTRACT

Introduction: This study aimed to identify relationships between the sense players made of situations and their decisions to continue with the planned play or change it. **Method:** Seven female elite basketball players from the same team participated in the study. A match was video-recorded. Post-performance interviews were conducted separately; each player was shown the video and asked to describe her activity in relation to the events observed. The interview data were used to identify how players made sense of situations and the relationships between sense-making and decision-making. **Results and discussion:** Results showed two steps in sense-making: assessment of the current situation, and anticipation of possible situation developments to manage risk. Results also showed that risk assessment led the players to continue or change the play. Results suggest players used situation recognition and mental simulation to make sense of situations. They changed the play to cope with risks, suggesting team resilience.

KEYWORDS

Rigor/Resilience; risk management; expertise; team functioning, elite sports.

INTRODUCTION

In recent years, there has been renewed interest in team functioning and team coordination in sport (e.g., Pederson & Cooke, 2006). Nevertheless, little is known about how team members undertake the tasks they face during a game, nor how they coordinate with other team members. To suggest some answers to this, Eccles and his colleagues conceptualized team coordination in sports by taking into account social and cognitive processes (e.g., Eccles, 2010; Eccles & Tran, 2012; Eccles & Johnson, 2009). Team coordination is the process of organising team members' actions in order to achieve the most positive outcome (Eccles & Tran, 2012). Team members' actions are arranged according to three dimensions, namely, type, timing and location. The type of action depends on the situation and team members' roles and competencies. Each type of action is carried out at a particular time and locus to enable the action to be successful.

Different studies showed that coordination among team members was facilitated by: (a) a shared mental model (i.e., common knowledge held by teammates; e.g., Pederson & Cooke, 2006); (b) "basic compact" (i.e., level of commitment of each individual to support coordination; Klein, Feltovitch & Woods, 2005); (c) action interpredictability (i.e., making his/her own actions predictable for team members; Klein et al., 2005); (d) communication (i.e., intentional and unintentional exchange of information among group members; e.g., Eccles & Tran, 2012); and (e) division of labour (i.e., different types of action undertaken by specific team members according to team-level planning; Eccles, 2010). Eccles (2010) suggested that studying coordination among players might improve knowledge of team functioning. He also stressed the lack of theory and research on team functioning and team coordination and called for studies focusing on when, how and why play develops.

In team sports, team-level planning seems to play an important role in coordination (Eccles & Johnson, 2009). This refers to the playbook defining plays (i.e., structured patterns of players' coordination and teammates' actions) for offensive and defensive options, according to: (a) players' roles within the team (i.e., guard, forward, and centre in basketball); (b) players' competencies; and (c) potential game development in relation to opponents (e.g., Eccles, Ward, & Woodman, 2009). Plays are planned before being undertaken by players. Plays are flexible and adaptive to allow players to adjust when the situation develops in a different way to that anticipated (e.g., timing of an attack). Little is known about what makes players continue with the play or change it during the game. In sports training and other domains characterized by uncertainty, high time pressure and high stakes, it is important to understand when and why team members decide to continue or change the plan.



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It is widely recognized that decision-making depends on sense-making (e.g., Klein, 2009). To better understand players' decisions within the game, it seems important to study what sense players make of situations. Sense-making has been theorised in the domain of Naturalistic Decision-Making (Klein, 2009; Klein, Moon, Hoffman, 2006a, b). Sense-making is the process of analyzing events retrospectively, explaining apparent anomalies, anticipating the future, and directing exploration of information. It consists of connecting the dots comprising events, knowledge, etc., to build a frame. It determines what is considered as a dot, in relation to our goal, competences, expectations, etc. Due to Simon's boundary rationality, we cannot connect all the dots. Under time pressure, getting more information could be counterproductive and it may be better to prioritise information and jump to conclusions. The frame can be added to or changed in the light of new information. Sense-making pertains to a double cycle comprising two steps: building the frame and maintaining it, with reference to Piaget's (1954) concept of assimilation, and reconsidering the frame and enriching it by new information, with reference to Piaget's (1954) concept of accommodation. This theory of sense-making seems useful in studying what makes teammates continue or change the play during the game. The present study aimed to investigate how players made sense of situations and the relationships between sense-making and the decision to continue or change the play.

METHOD

Participants

Seven elite female basketball players from the same team volunteered to participate. They ranged in age from 16 to 18 years ($M= 17.3$ years, $SD= 0.5$ year) and had been playing basketball for 4.5 to 10.5 years ($M= 9$ years, $SD= 2$ years). They had been playing for the same team for 1.5 to 2.5 years ($M=2,3$ years, $SD= 0.5$ year). Since the present study was conducted, five of the participants have represented France during the European Championships. Players were given pseudonyms to provide some degree of confidentiality: numbers 1 to 7. The study was approved by a local ethics committee.

Data Collection

A senior French Championship match was recorded by a camera placed in the stand near the centre of the court (lengthwise).

Self-confrontation interviews were conducted with each player separately the day after the match. Interviews were conducted regarding the fourth quarter of the match (i.e., final ten minutes). This was the only period when the two teams successively led the score. Earlier, the team being studied led the score. Many coaches stress that when the score is tight, players are more involved in the game in order to prevent the opponents from scoring. It could be argued that, due to the tight score, this fourth quarter had greater uncertainty regarding situation development and match outcome, and consequently more changes to planned plays. Interviews were recorded ($M= 48.2$ min, $SD= 2$ min) and transcribed.

Data Processing

Data processing was done using the constant comparative method (Corbin & Strauss, 1990). Two researchers processed the data. Firstly, each researcher divided the transcripts into meaningful units according to the decision to continue or change the play. Secondly, researchers identified what information players connected and how they connected it to make sense of situations. Thirdly, they identified the relationships between sense-making and the decision to continue or change the play. After each data processing step, data were constantly compared until saturation was reached, which occurred when no further meaningful unit and category were identified from the data. The two researchers compared their results and discussed any initial disagreement until consensus was reached. Interview transcripts were divided into 195 meaningful units.

RESULTS

Results are presented in two parts. The first deals with the sense players made of situations. The second refers to the relationships between sense-making and decision-making.

Sense Players made of Situations

Results showed that in order to decide whether to continue or change the play, players first made sense of a situation. They connected information about players' placement and movement on the court, players' competencies, tendencies and roles, and ball trajectory. Two steps were identified: (a) assessment of current situation development, and (b) anticipation of potential situation development. Players used solely the first step, or both steps, depending on the situation.

Assessment of current situation development consisted of building up a frame of the way the situation had developed. It was based on comparison between information pertaining to the expected situation development and actual situation development. Players checked the situation was developing as expected according to the playbook. For example, Player 2 said:

“I can see them and I know where they are and what they're going to do in this situation because I know them. I check what they're doing. I'm looking at [Player 7] and seeing she's coming into this zone as she is required.” Similarities between expected and actual situation development indicated that players did not perceive any risk about situation development.

Anticipation of potential situation development consisted of reconsidering the frame created and enriching it with new information. New information related to predicting a player's possible actions and the consequences on the game. Results showed two kinds of anticipation: (a) an opponent's or teammate's risky action which could jeopardize the success of the play; and (b) a teammate's action which was not required by the play, however, which could achieve a positive outcome and avoid risk-taking in comparison to the action required by the play. In the first kind, anticipation led the player to investigate the consequences of risky action and assess whether the risk was difficult to manage or manageable. Risk was considered difficult to manage when the player thought it would have been very difficult to make the play work. It was considered manageable when the player believed she could cope and make the play work. For example, Player 4 said:

“Her opponent might catch the ball after the free-shot. I'm supporting my teammate by guarding her opponent to make the play work”.

In the second kind of anticipation, the player anticipated a different situation development to that expected according to the play. Anticipation led the player to change the play in order to achieve a positive outcome without risk-taking. The player anticipated such a development as a teammate was either better placed than her or another teammate with whom she was expected to coordinate and her placement was not risky, or she was more competent in this situation than required. For example, Player 3 said:

“I was supposed to pass to [Player 1] who was guarded and I saw [Player 5] close to me. She tends to play for herself and I felt the current situation was good for her: it was an offensive dual. I showed her I was ready to help her. I know she's able to play an offensive dual easily. I know that as she's going to receive the ball, she's going to want to play by herself. She's 1,93m tall [6'4"] and nobody can stop her.”

Relationship between Sense-making and Decision-making

According to the playbook, players were required to undertake planned plays so that their teammates knew what would happen and could achieve positive outcomes. They were also required to change the play when situations developed in a different way to that anticipated. Results showed that players assessed risk which could jeopardize the success of the play, in order to decide whether to continue or change the play. Results showed four levels of risk: (a) no risk; (b) manageable risk; (c) risk that was difficult to manage; and (d) risk avoidance.

Checking that actual situation development was as expected from the playbook and was not risky led players to continue with the play (41% of total decisions). For example, while checking her teammate was well placed, Player 2 said: “As I see her, I guard my opponent, like I'm supposed to do.”

Assessing risk as manageable led players to continue with the play. To cope with risk and achieve a positive outcome, players decided to be more involved while facing the opponent's action (22% of total decisions). For example, Player 1 said:

“I'm not focusing on my teammates because I'm on the ball. The opponent I'm required to guard might make a screen on my playmaker. I tell her about the screen and stay focused on my defence on the ball. I must watch this opponent's every move.”

Assessing risk as difficult to manage led players to change the play. Players avoided taking the risk that the play might fail (18% of total decisions). For example, Player 7 said:

“My teammate wants to set me the ball. I'm supposed to shake off my defender but she makes an “over-play”, so I make a “back-door”. She's defending close to me so I can't get the ball. I get away. My teammate has to change wing to pass the ball.”

Risk avoidance led the player to change the play because a teammate was better placed or more competent than the player required by the play (19% of total decisions). For example, Player 7 said:

“my teammates were making screens to allow me to go ahead with the ball. I saw [Player 2] was ahead and alone because her defender was in late. So, I set her the ball.”

DISCUSSION

These results are discussed in two parts: (a) consistency of results to the sense-making theory; and (b) planned decision versus emergent decision.

Consistency of Results to the Sense-making Theory

As the theory of sense-making predicts (Klein, 2009; Klein, et al., 2006a, b), players assessed the situation by connecting dots pertaining to available information on situation development, in order to build a frame. In some situations, they enriched the frame by anticipating situation development from players' current actions, placements and competencies. Information on situation development was compared to that memorised from the playbook and known about teammates' competencies and tendencies. These results suggest that sense-making was governed by recognition of situation and mental simulation, consistent with the Recognition Primed-Decision Model (Klein, Calderwood & Clinton-Cirocco, 1986).

Results showed that assessment and anticipation of situation development were governed by the players' placements and actions, and teammates' competencies and tendencies. These results are consistent with Macquet's (2009) study on volleyball players' decision-making.

Results also showed that players anticipated specific scenarios and assessed risk-taking in order to consider whether risk was manageable. If they considered risk was manageable, they continued with the play; if not, they changed. Results suggest that risk assessment refers to the anticipate-adapt perspective developed by Shapira and described by Klein (2009). This perspective allows players to cope with complex, ambiguous and unpredictable situations and to manage risk.

Planned Decision Versus Adapted Decision

Results showed that players continued with the play as long as they considered they could make it successful. As situations became too risky, or to avoid risk-taking, players changed the play in light of the opponent's and teammate's actions. Continuing with the play suggests rigor in team functioning; it allows action interpredictability (e.g., Klein et al., 2005). Adapting the play to the evolving situation suggests resilience in team functioning. The results are consistent with existing theory about resilience engineering (Hollnagel, Woods, & Leveson, 2006; Klein, 2009). Hollnagel et al. (2006) described resilience engineering as a way of designing systems and organisations to be flexible in order to cope with unpredictable risks. Instead of using safeguards against previous threats, resilience engineering aims to improve the system capacity to reconfigure in order to cope with unexpected risks. One function of resilience engineering is reliance on system adjustment capacities by preparing team members to expect to face unpleasant surprises rather than trying to predict and prevent risks. In sports, few researchers have provided evidence of experts' engagement in such a process (Horton, Baker, & Deakin, 2005; Klein, 2009).

At the applied level, it seems important to develop team resilience as “a tactic for protecting ourselves against risk” (Klein, 2009; p. 249). Beyond developing plays for offensive and defensive options, coaches might use drills involving changing conditions (e.g., timing of an attack, number of players involved in a specific play) to force players to adjust coordination to changing conditions. This would contribute to developing the flexibility of using tactical solutions in changing game conditions, and the originality of tactical solutions chosen by teammates. Coaches might also ensure that players are realistic in interpreting situations. Optimistic bias seems to play a role in risk-seeking: individuals misread the risks, leading them to be overconfident, and to give greater weighting to successes than failures (Kahneman, 2011). Overconfidence might prevent team resilience.

This study presents a limitation. It did not feature other teams and matches for comparison.

In conclusion, the data tend to support the view that sense-making and more specifically risk assessment play a key role in coordination among players, leading players to use team-level planning, or change it to adapt to evolving game conditions. The continued study of coordination will improve our understanding of team functioning and team performance.

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