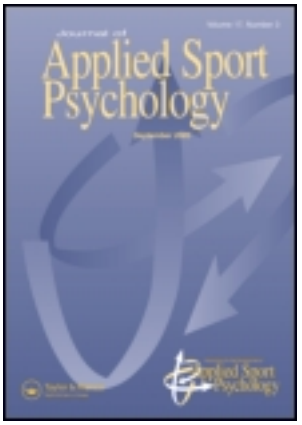

Journal of Applied Sport Psychology
Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/uasp20

Decision-Making during Games by Professional Handball Coaches Using Regulatory Focus Theory

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Accepted author version posted online: 14 Jun 2013.Published online: 18 Nov 2013.

To cite this article: Thierry Debanne , Vincent Angel & Paul Fontayne (2014) Decision-Making during Games by Professional Handball Coaches Using Regulatory Focus Theory, Journal of Applied Sport Psychology, 26:1, 111-124, DOI: 10.1080/10413200.2013.801370

To link to this article: http://dx.doi.org/10.1080/10413200.2013.801370

JOURNAL OF APPLIED SPORT PSYCHOLOGY, 26: 111–124, 2014

ISSN: 1041-3200 print / 1533-1571 online
DOI: 10.1080/10413200.2013.801370

Routledge
Taylor & Francis Group

Decision-Making during Games by Professional Handball Coaches Using Regulatory Focus Theory

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The main goal of this study, based on regulatory focus theory, is to assess the effects of the reward structure on the defensive strategy of handball teams. The results show that (a) a promotional defensive strategy is more often preferred in the second half of the second half-time than in any other game period and (b) second-division coaches are more likely to put their players in regulatory fit situations than are first-division coaches, and could, thus, be more influenced by affordance situations than first-division coaches, who would be more concerned with the ratio of strength between the teams.

INTRODUCTION

Team sport competitive situations make up a specific subclass in the generic class of dynamic situations (Debanne & Chauvin, 2013; Fiore & Salas, 2006; Hagemann, Strauss, & Büsch, 2008; Macquet, 2009), which share a common characteristic: the fact that the situation is evolving, even without any intervention from the operator. In this kind of specific situation, the coach is required to make many decisions that have major consequences on the outcome of the game and the relevance of these choices is a reflection of the coach's skill in team management (Horton, Baker, & Deakin, 2005). Despite an increase in coaching science research (see Gilbert & Trudel, 2004, for review), few studies have focused on the decision-making process during actual competitions (Debanne & Fontayne, 2009; 2012; Duke & Corlett, 1992; Gilbert, Trudel, & Haughian, 1999; Hagemann et al., 2008; Jones, Housner, & Kornspan, 1997; Smith & Cushion, 2006; Wilcox & Trudel, 1998) and none, to our knowledge, have focused on the choice of a defensive strategy, despite it appearing to be an important element for coaches (Lyle, 2002). This is why the goal of this study is to perform for the first time, to

Received 30 November 2012; accepted 29 April 2013.
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our knowledge, a quasi-experimental study in a real competitive environment and to examine specifically how coaches make decisions concerning defensive strategies in specific contexts (time remaining, score, man-advantage or man-disadvantage) that must be taken into account in the coaching process (Côté, Young, North, & Duffy, 2007; Gilbert, 2007; Lyle, 2007). Indeed, these contextual factors can affect the interpretation of rewards that is strongly influenced by active goals held by teammates. In particular, a distinction is made between approach goals, desirable end states that one wants to work toward, and avoidance goals, undesirable end states that one wishes to prevent from occurring (Carver & Scheier, 1998).

Regulatory Focus Theory

Regulatory focus theory (Higgins, 1997, 1998) provides a framework to examine how situational differences influence people's decisions depending on their self-regulatory orientation, and has great potential for the understanding and enhancement of sport performance (Plessner, Unkelbach, Memmert, Baltes, & Kolb, 2009). According to this theory, decision-making in dynamic environments depends on two self-regulatory and motivational principles that govern human behaviors and strategies or tactics to reach a goal: (a) a promotion focus is sensitive to the presence or absence of positive outcomes and uses approaches as a strategic means (e.g., "we have to win this game"; "we need to get this ball back quickly") and (b) a prevention focus is sensitive to the presence or absence of negative outcomes and uses avoidance as a strategic means (e.g., "we can't lose this game"; "we must prevent the opposing team from scoring a goal").

Scholer, Zou, Fujita, Stroessner, and Higgins (2010) showed that a promotional orientation of behavior becomes a motivational necessity when an individual is in a state of loss, when the individual is in a prevention-focused regulatory state, and when the risky option alone offers the possibility of avoiding loss. Although there are stable individual differences in dominant chronic regulatory focus (Higgins, 1997), one's current focus also depends on situational factors (Higgins, 1998; Higgins & Silberman, 1998; Shah & Higgins, 2001) and situations often induce a regulatory focus that can override this long-term tendency (Shah, Higgins, & Friedman, 1998). The influence of the regulatory focus on the way we see and cope with the world (Scholer & Higgins, 2010) depends on the interaction between one's regulatory focus and the environment's local reward structure, that is, the gains or losses resulting from one's actions (Higgins, 2000; Maddox, Baldwin, & Markman, 2006). When a promotional person is in an environment promoting maximized gains, or when a preventive person is in an environment minimizing losses, it is called a regulatory fit. Conversely, when the regulatory focus and the reward structure do not match, it is called a regulatory mismatch.

Fit between the regulatory-focus-induced processing characteristics and the nature of the environment influences performance positively (Otto, Markman, Gureckis, & Love, 2010). This has been shown even in tasks that heavily involve motor skills, where authors have considered only subjects' chronic orientation (Kutzner, Förderer, & Plessner, 2012; Memmert, Unkelbach, & Ganns, 2010; Plessner et al., 2009). This positive link between fit and performance can be explained in two ways. Firstly, many authors highlighted the cognitive consequences of regulatory fit (Grimm, Markman, Maddox, & Baldwin, 2008; Higgins, 2000; Maddox, Baldwin, & Markman, 2006; Worthy, Maddox, & Markman, 2007). They showed that compared to a mismatch, a fit between the situational regulatory focus and the task's reward structure leads to greater cognitive flexibility, defined as the ability to spontaneously restructure one's knowledge in many ways, in an adaptive response to radically changing situational demands (Spiro & Jehng, 1990). More precisely, Memmert et al. (2010) showed a positive regulatory fit effect on the allocation of attentional resources (i.e., a broader scope of attention) contributing to improve performance in a detection task, while Freitas and Higgins

(2002) showed that a fit leads to a feeling of doing something right and feeling good about it. Indeed, if one feels right about what one is doing, the task does not require one's full attention, and, thus, one is open to more alternatives or flexible solutions. Secondly, regulatory fit contributes to value by increasing the strength of engagement to complete a task through the improvement of intrinsic motivation and motivational intensity or persistence in spite of difficulties encountered (Bianco, Higgins, & Klem, 2003; Förster, Higgins, & Idson, 1998; Higgins & Spiegel, 2004). Actually, it is also possible to explain regulatory fit's consequences with feeling-as-information theory (Schwarz, 2012), which is an extension of mood-as-information theory (Schwarz & Clore, 1983). In a general way, Schwarz (2012) explains how a feeling, conceptualized as a combination of moods, emotions, metacognitive experiences, and bodily sensations, is able to influence individuals' judgments and behaviors, depending on whether the situation is considered as benign (absence of risk) or problematic (presence of risk). Thus, we could consider that a regulatory fit situation provides a positive feeling (as feeling right) similarly to a situation perceived as benign and that a regulatory mismatch situation provides a negative feeling similar to a situation perceived as problematic.

Research in organizational and team literature has convincingly demonstrated that the characteristics and demands of the environment in which an organization is embedded interact with its structure to determine the organization's ultimate effectiveness (Beersma et al., 2003; Hollenbeck et al., 2002; Thompson, 1967). Depending on the degree of fit between the characteristics of the structure and the demands of the environment, a particular organizational structure is advantageous in some task environments but a hindrance in others (Galunic & Eisenhardt, 1994). In the same way, Dimotakis, Davison, and Hollenbeck (2012) showed that achieving regulatory fit by aligning team structure with the task characteristics is operationally important. Therefore, these authors suggest that managers would be wise to consider matching team structure to the regulatory focus of desired task outcomes, and could create and train teams that are optimally suited to address promotion- or prevention-oriented tasks.

Defensive Strategy as the Regulatory Focus of Players

Gréhaigne, Godbout, and Bouthier (1997) showed that players' intentions are represented primarily in the defensive phase of the game, either when recapturing the ball or when defending the goal. Furthermore, coaches can translate their intention of ball recovery by choosing a specific team structure in which defenders spread out around the field in order to try to catch the ball during throws between offensive players. This team structure is more effective in intercepting the ball (see Figure 1a). The intention to intercept the ball is associated with a gains reward structure based on gain seeking (gaining the ball), and necessitates a promotional focus, so that the reward structure and regulatory focus fit. Conversely, the intention to defend the goal can be met by choosing another specific team structure, which consists in positioning all the players along the goal area line. This team structure reduces gaps between defensive

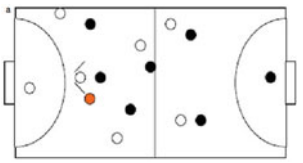

Figure 1a. Defensive strategy to recapture the ball (color figure available online).

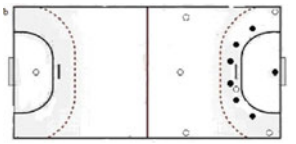

Figure 1b. Defensive strategy to defend the goal (color figure available online).

players and decreases the offensive players' possibilities of approaching the goal (see Figure 1b). The intention to defend the goal is associated with a reward structure based on avoiding loss (preventing a goal), and necessitates a preventive focus to make the reward structure and the focus orientation fit. One issue that seems to remain largely unconsidered in applied sport science is the influence of coaches' division level on their strategic and tactical choices during the evolution of the game. In an exploratory perspective, we propose that due to differences among coaches in their levels of experience of high levels of competition and of talent management, coaches have a potential effect on the choice to attain or to maintain a regulatory fit between the defense strategy and the reward structure.

Reward Structure Linked to Game Situation

Based on current research (Debanne & Fontayne, 2012; Lyle, 2007), it seems likely that a number of contextual factors affect the coaching process, because they modify the reward structure during the match. Indeed the reward structure is a setting that affects an evaluation of success (Ames, 1992) based on a comparison between the actual situation and the desired end state (victory). It is also a dynamic structure evolving with the score difference between the teams, and the numerical difference as well. Thus, although the match is in progress, coaches can choose to seek gain (for instance, while their team is leading or/and when it has a one-man advantage after 2 min suspension[s]) or to avoid loss (for instance, while their team is leading and/or is at a numerical disadvantage after 2 min suspension[s]). By considering the dynamic aspect of this structure, the time remaining to the end of the game appears to be a critical parameter that could affect the intensity of the present reward structure. Indeed, being ahead by four points during the first half-time does not have the same consequence on the reward structure as it would a few minutes before the end of the match.

Hypothesis

Based on the theoretic background, we postulate that the reward structure affects coaches' decision-making processes, and we make the following hypotheses:

1. The choice of a defensive strategy depends on the reward structure. Specifically, when there is a gains reward structure situation, coaches tend to choose a defensive strategy promoting the recapture of the ball, so the players have a promotion focus. Conversely, when there is a losses reward structure situation, coaches tend to choose a defensive strategy promoting the defense of the goal, so the players have a prevention-focus.
2. There is an effect of regulatory fit on defensive performance. When the defensive strategy fits with the situation's reward structure (a regulatory fit situation), performance would be better than during a mismatch situation.

Figure 2a. Prevention-oriented defensive strategy (aligned defense) (color figure available online).

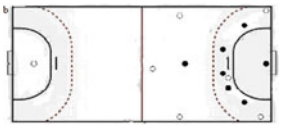

Figure 2b. Median-oriented defensive strategy (staged defense) (color figure available online).

Figure 2c. Promotion-oriented defensive strategy (high staged defense) (color figure available online).

3. There is an effect of the coach's level on regulatory fit. First-division coaches put their players in regulatory fit situations more often than do second-division coaches.

METHOD

The research was conducted in accordance with ethical standards (Harris & Atkinson, 2009), and was approved by the ethics committee of Paris-Sud University.

Participants

All of the handball professional coaches ($n = 30$) from the top two male professional French championships (first division [$n = 14$] and second division [$n = 16$]) during the 2011–2012 season participated in this study. All raw data was collected through the video recording of 36 games (18 first division games and 18 second division games), downloaded from the website www.dartfish.tv. These games were selected using a simple random method, with the only criterion being that each coach could be observed at least twice.

Presentation of Variables

This study includes two dependent variables: (a) defensive strategies, (b) defensive performance; and two independent variables: (a) situation's reward structure, (b) game periods.

In accordance with Chabaud, Berthier, Massarelli, and Farget (2011), defensive strategies are evaluated with three modes depending on the positions of the defensive players on the court, (a) aligned defense (all the players line up around the 6 m goal line, [1]), (b) staged

Table 1
Distribution of Game Situations Between Reward Structure and Contextual Factors

Numerical Difference	Opposing Relationship	Reward Structure	*N*
Inferiority	*Unfavorable*	Unclear	83
	Balanced	Losses	144
	Favorable	Losses	80
Equality	*Unfavorable*	Gains	570
	Balanced	Neutral	1243
	Favorable	Losses	628
Superiority	*Unfavorable*	Gains	108
	Balanced	Gains	182
	Favorable	Unclear	96

N = Number of observations.

defense (only one player cruises outside the 9 m perimeter, defense, [2]), and (c) high staged defense (at least two defensive players cruise outside the 9 m perimeter, [3]; see Figure 2).

Defensive performance is noted with the result of each game phase ("goal" if a goal was scored by the opponent [-1], and "no goal" [0]).

The situation's reward structure (gains, neutral, losses and unclear) can be characterized combining two contextual factors (see Table 1): (a) numerical difference between the teams (numerical inferiority, when the opposing team has a one-man or more advantage over one's own team [INF], numerical equality [EQU], and numerical superiority when one's own team has a one-man or more advantage over the opposing team [SUP]), and (b) ratio of strength between the teams, defined as a group of players confronting another group of players for an object (Gréhaigne et al., 1997), and deduced from the score's difference (Δ_{score}). This ratio of strength between the two teams is considered as unfavorable when $\Delta_{score} < -2$ [UNFAV], balanced when $-2 \leq \Delta_{score} \leq 2$ [BAL], and favorable when $\Delta_{score} > 2$ [FAV]). However, just before the end of the game, we choose arbitrarily that during the final two defensive phases, if $\Delta_{score} < 0$, then the ratio of strength is considered as unfavorable [UNFAV]; if $\Delta_{score} = 0$, then the ratio of strength is considered as balanced [BAL]; and if $\Delta_{score} > 0$, then the ratio of strength is considered as favorable [FAV]. The reward structure is arranged as follows: if the numerical difference between the two teams and the ratio of strength is equivalent in terms of reward structure, both help to characterize the reward structure (SUP and UNFAV characterize a gains reward structure; INF and FAV characterize a losses reward structure). If one of the two variables is neutral, the second would characterize the reward structure. If the numerical difference between the two teams and the ratio of strength is heterogeneous in terms of reward structure, the latter is qualified as "unclear."

Four game periods are identified for each match (first half of the first half-time [P11], second half of the first half-time [P12], first half of the second half-time [P21], and second half of the second half-time [P22]).

Procedure

The first step consisted in breaking down into sequences the attack and defense phases in each of the 36 observed games ($n = 8222$). Only placed defenses (defense phase when the defense sets up after a stoppage in play or when a counter attack was stopped, allowing defensive players to close the gaps around the goal-area line) were kept for further investigation ($n = 3134$) because only these phases are useful for identifying the defensive strategy, and thereby, the coaches' decision-making processes. They can be structured with different defense systems (e.g., 6–0; 5–1; 3–2–1; 4–2; 3–3, or man-to-man defense).

Table 2
Level of Regulatory Fit

Reward Structure	Defensive Strategy	Level of Regulatory Fit	*N*
Losses	*Prevention*	Fit	654
	Promotion	Mismatch	28
	Median	Median	170
Gains	*Prevention*	Mismatch	339
	Promotion	Fit	168
	Median	Median	353
Neutral	*Prevention*	Median	691
	Promotion	Median	40
	Median	Median	512

N = Number of observations.

In a second step, the reward structure of each game phase was linked to the 3134 defensive phases. However, situations in which the reward structure was unclear were excluded from analysis ($n = 179$).

In a third step, we associated each defensive strategy with a particular focus. The characteristic "aligned defense" (6–0 defense system) is associated with a preventive focus because all the players seek to protect their goal and want, above all, to avoid conceding a goal, whereas staged defense (5-1 or 3-2-1 defense systems) is associated with a median focus, and high staged defense (4-2; 3-3; or man-to-man defense system) is associated with a promotion focus because all the defensive players seek to prevent the opponents from keeping the ball and so seek to recapture it.

In a fourth step, each match was divided into four quarters.

Finally, in order to determine the effect of regulatory fit on defensive performance, we (a) identified regulatory fit by crossing the regulatory focus with the situation's reward structure (see Table 2) and noted (a) the result of each game phase, (b) the situations in which the teams were in numerical superiority ($n = 386$), in numerical equality ($n = 2441$), or in numerical inferiority ($n = 307$) in order to compare the situations with the same number of players.

Reliability

To guarantee the reliability of the coding scheme, we asked three professional coaches to code the data independently. They met expert-coach criteria (Côté, Salmela, Trudel, Baria, & Russel, 1995) with (a) a minimum of 10 years of coaching experience, (b) a performance outcome measure, having played at the international level, and (c) recognition as among the best to develop elite athletes. Each agreed to code three matches, so a sample of nine matches was coded, allowing us to assess coding reliability ($n = 777$). The reliability points were estimated using a kappa index (k) that represents the normalized proportion of inter-observer agreement in excess of what would be expected on the basis of chance or random assignments. We used MacKappa software (Watkins, 2002), which calculates both general and conditional coefficients and tests the statistical significance of agreement among many observers assigning objects to nominal scales based on Fleiss' (1971) computational formulae. The overall kappa revealed a considerable degree of agreement among the coders ($k = 0.99$; $z = 28.37$, $p < .0001$). All of the conditional coefficients were also high and significant (see Table 3). Taken as a whole, these results showed acceptable reliability of the coding.

Table 3
Reliability of Coding Sample

Defensive Strategies	No. (%)	Kappa	Z
Prevention	485 (62.4)	0.99	8.04***
Median	220 (28.3)	0.98	10.29***
Promotion	072 (09.3)	0.97	8.55***
Overall	777	0.99	28.37***

***$p < .001$.

Data Analysis

A 2 (coach level: first division vs. second division) × 3 (reward structure: gain vs. neutral vs. loss) × 4 (game periods: P11 vs. P12 vs. P21 vs. P22). Analysis of Variance (ANOVA) was performed to determine the effects of the coach's level (first division vs. second division), the reward structure of game situations (gains vs. neutral vs. losses) and the game periods (P11 vs. P12 vs. P21 vs. P22) on the defensive strategy chosen.

Two other ANOVAs, with a principal factor, were performed to determine the effects of regulatory fit levels (fit vs. median vs. mismatch) on defensive performance, one in man-advantage game situations and the other in numerical equality game situations (in game situations with numerical inferiority, all defensive systems are aligned, therefore as there is no variance, it is unnecessary to perform an ANOVA).

RESULTS

The first ANOVA (2 × 3 × 4) revealed two main effects and two interaction effects on the choice of defensive strategy.

Main Effect of Reward Structure on Defensive Strategy

The ANOVA revealed a significant main effect of the reward structure on defensive strategy, $F(2, 2931) = 137.16$, $p < .00001$. Fisher's LSD post-hoc comparisons (ps $< .0001$) showed that the defensive strategy is more often promotion-oriented ($M = 1.77$, $SD = 0.02$) in a gains reward structure situation than in a neutral reward structure ($M = 1.47$, $SD = 0.02$) or a losses reward structure ($M = 1.27$, $SD = 0.02$) situation.

Main Effect of Game Period on Defensive Strategy

The ANOVA also revealed a significant main effect of game periods on defensive strategies, $F(3, 2931) = 12.99$, $p < .00001$. Post-hoc comparisons revealed a significant difference between (P22) and all others (ps $< .00001$). Indeed, during P22, the defensive strategy is more promotion-oriented ($M = 1.62$, $SD = 0.02$) than during other periods: ($M = 1.45$, $SD = 0.03$), ($M = 1.48$, $SD = 0.02$), ($M = 1.45$, $SD = 0.02$) for P11, P12 and P21 respectively.

Interaction Effect (Reward Structure) × (Game Periods) on Defensive Strategy

The ANOVA revealed an interaction effect of game periods and reward structure on defensive strategy, $F(6, 2931) = 15.41$, $p < .00001$, (see Figure 3). Fisher's LSD post-hoc comparisons showed (a) when there is a losses reward structure, the defensive strategy is

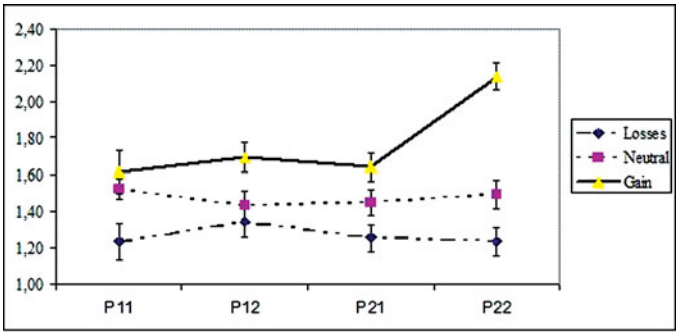

Figure 3. Interaction effect (reward structure) x (game periods) on defensive strategy (color figure available online).

significantly ($p < .05$) more often prevention-oriented during the second half of the second half-time than during the second half of the first half-time, (b) when there is a gains reward structure, the defensive strategy is more often promotion-oriented during the second half of the second half-time than in any other game period ($ps < .0001$).

Interaction Effect (Coach's Level) × (Reward Structure) on Defensive Strategy

The ANOVA revealed a significant interaction effect of the coach's level (first vs. second division) with the reward structure on the defensive strategy used, $F(2, 2931) = 6.56$, $p = .001$ (see Figure 4). Indeed, Fisher's LSD post-hoc comparisons showed a significant difference ($p = .003$) between the defensive strategy chosen by first division coaches ($M = 1.70$, $SD = 0.04$) and that chosen by second division coaches ($M = 1.83$, $SD = 0.04$) during a gains reward structure; and Fisher's LSD post-hoc comparisons showed a significant difference ($p = .001$) between the defensive strategy chosen by first division coaches ($M = 1.31$, $SD = 0.03$) and second division coaches ($M = 1.23$, $SD = 0.03$) during a losses reward structure. In this sense, second division coaches put their players in regulatory fit situations significantly more often than first division coaches.

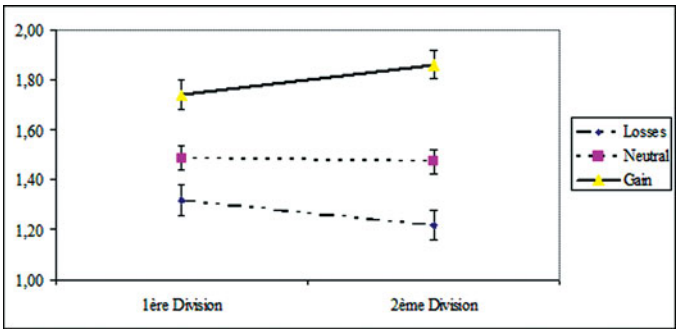

Figure 4. Interaction effect (reward structure) × (coach's level) on defensive strategy (color figure available online).

No significant difference ($p = .67$) was found between first division coaches ($M = 1.46$, $SD = 0.02$) and second division coaches ($M = 1.47$, $SD = 0.02$) during a neutral reward structure.

Effect of the Regulatory Fit Level on Performance

ANOVAs performed to assess the effect of regulatory fit on defensive performance, one for man-advantage situations, and the other for numerical equality, revealed no significant effect, $F(2, 1196) = 1.11$, $p = .33$, $F(2, 288) = 0.30$, $p = .74$, respectively.

DISCUSSION

The aim of this study was to assess the effects of the reward structure on coaches' decision-making processes concerning defensive strategies during matches. Defensive strategies are associated with the regulatory focus (prevention vs. promotion) of defensive players. Our results confirm the hypothesis of a reward structure effect on defensive strategy. Indeed, the more the reward structure is gains-oriented, the more often coaches tend to choose promotion-oriented defensive strategies. However, coaches take the reward structure into account more during the second half of second half-time than during other periods. This promotion-oriented strategic choice during the second half of the second half-time can be linked with "the goal looms larger effect" in which motivation to reach the goal increases (e.g., intensity of efforts in order to gain a match) as the distance to the goal decreases (Förster et al., 1998). Indeed, these authors highlighted that promotion-focused individuals show greater approach strength as the goal looms larger, whereas prevention-focused individuals show greater avoidance strength as the goal looms larger. Thus, if the final goal is to win the match, chronic preventive coaches would prefer a preventive strategy whereas chronic promotional coaches would prefer a promotional strategy, when victory is near. Chronic preventive coaches would prefer a preventive-defense strategy in order to prevent the opposing team from scoring a goal and chronic promotional coaches would prefer a promotional-defense strategy in order to get the ball back quickly and insure the victory, by scoring another point.

The results of this study show no regulatory fit effect on defensive performance (based on score) and appear to contradict previous studies (Maddox et al., 2006; Otto et al., 2010). So, our second hypothesis cannot be validated. Therefore, our findings do not indicate the right way to achieve high-defensive performance. This can be explained by three factors. First, the coaching decision-making context is much more complex than most of the experiments conducted in the individual regulatory focus literature, and particularly during matches in a competitive environment where coaches' central goal is their own team's performance. For this, the object of their action is neither their own team, nor the opposing team, but the opposition relationship between the two, defined as an antagonist link existing between two groups of players confronted by virtue of certain rules of a game that determine a pattern of interaction (Gréhaigne et al., 1997). Therefore, the coach seeks the defensive strategy that will create the most difficulties for the opponent. So, the reward structure appears only as an external factor to this opposition relationship. Secondly, within a hierarchy of approach and avoidance motivations, the levels of approach and avoidance are independent (Elliot & Church, 1997; Elliot & Trash, 2002; Higgins, 1997; Higgins, Roney, Crowe, & Hymes, 1994). Many authors (Higgins, 1997; Scholer, Stroessner, & Higgins, 2008) distinguish three hierarchical levels of self-regulation through a regulatory focus frame: the system (characterized by the end-states that regulate behavior), strategic levels (means or process of moving towards a desired end-state or moving away from undesired end-states), and tactical levels (instantiation of a strategy in a given context). This study focused only on the strategic level (mean or process) and not

on the tactical level of the players' focus orientation. In so far as these levels are independent, it may well appear—at the tactical level—that the guidelines focus on promotional strategies for prevention, and vice versa, as guidance in a preventive focus of promotional strategies. For example, when defensive strategy is prevention-oriented, one defensive player can take the tactical initiative to get out of aligned defense to intercept the ball. Finally, during the second half of the second half-time and when the reward structure is gains-oriented, if the defensive strategy does not change, the number of offensive phases could be insufficient to hope to score, even with great offensive efficacy. This is why coaches choose a promotion-oriented defensive strategy, from which they hope to capture the ball quickly, in order to (a) reduce the length of opponent offensive phases and (b) to score quickly. With this defensive strategy choice, coaches hope to obtain more offensive phases than with initial defensive strategy and so to keep a chance of winning the match. We note that this strategy should also be tested before this last game period, especially when the team is in a losses reward structure. Indeed, choosing a promotional defensive strategy in a losses reward structure could be the only way to reach a gains reward strategy that is likely to be reinforced during the last game period as suggested by results of the study.

Last, the fact that our results contradict our third hypothesis (first-division coaches' choices are more likely to choose a regulatory fit between strategic orientation and situational reward structure than are second-division coaches) is particularly interesting. Indeed, second-division coaches more significantly aligned the orientation of their players' focus with the reward structure. This may mean that second-division coaches are more influenced by the affordance related to the situation's reward structure than are first-division coaches, who would be more concerned with the balance of the ratio of strength between the teams and the defensive system that would cause real problems for the opposing team. First-division coaches would allow their team to acquire more assertive game strategies, and be less susceptible to changes in environmental factors, with variations at the tactical level (depending on what encourages the reward structure) while maintaining a given defensive strategy. On the tactical level, the coach would have to provide his or her players with the guidance of a focus of either a preventive or promotional type. This would explain how first-division coaches change their defensive strategy less based on game evolution than do second-division coaches.

Practical Implications

Our results, and regulatory focus theory in general, suggest some practical implications for coaches. One can recommend (a) measuring the players' chronic regulatory focus, using the General Regulatory Focus Measure (Lockwood, Jordan, & Kunda, 2002) or the Regulatory Focus Questionnaire (Higgins et al., 2001), complementary to physical fitness or skills of players, and playing players with a chronic focus which fits with the situation's reward structure or the defensive strategy used; (b) using defensive strategies that are promotion-oriented when there is a gains reward structure, before the last game period, in order to test the efficacy of these defensive strategies, without waiting for the last moment; and (c) taking into account the probable change of the opponent's defensive strategy when the opponent's reward structure is gain-oriented and during the second half of the second half-time, and anticipate it especially during team time-out.

Limitations and Future Research

As with any research, our study has a number of limitations that should be acknowledged. First, our data were collected only from handball teams, which may limit the generalizability of our results to specific issues of handball. Others studies should investigate equivalent regulatory

processes in other team sports, such as soccer or rugby. In addition, we did not evaluate the coaches' influence; while, in some situations, the coaches may have conveyed their desired strategy through signals or hand gestures, and in others they may have used words at yet other times they may not have had any influence at all. Also, sometimes only a few words may be exchanged, and in other situations there may be time for a minute or two of explanation or discussion. This could impact the extent to which regulatory fit could be matched. The present study highlighted an interaction effect of the coaches' level with the reward structure on the choice of a defensive strategy. We did not check the coaches' chronic regulatory orientation, although it may explain why some coaches change their defensive strategies, while others do not. Indeed, empirical research demonstrates that promotion-focused individuals are more open to change, whereas prevention-focused individuals prefer stability (Liberman, Idson, Camacho, & Higgins, 1999). In an experiment in which participants were asked to choose one of two specific investment funds for their retirement plan (take specific action) or relinquish the decision and be random (engage in inaction), prevention-focused decision-makers were significantly more likely to engage in inaction than were promotion-focused decision-makers (Chernev, 2004). Finally, although this study highlighted a reward structure effect on coaches' decision-making processes concerning defensive strategies, it did not clearly evaluate the importance of this effect. We did not, for instance, consider the effect of each component of the reward structure (ratio of strength and numerical difference between the two teams). Therefore, we encourage further research in this direction.

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