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The Effect of Coach's Task- and Ego-Involving Climate on the Changes in Perceived Competence, Relatedness, and Autonomy Among Girl Handballers

Philippe Sarrazin, Emma Guillet, and François Cury

Adolescents, especially females, have been identified as a group at risk of poor health due to their declining level of physical activity. To prevent sporting attrition, several researchers highlighted the importance of the fit between the motivational context provided by the coach and the socio-emotional needs brought by adolescents. This study concerns the role of the coach's task- and ego-involving climate on the changes in 3 fundamental perceptions underlined by the self-determination theory (8): perceived competence, autonomy, and relatedness. Contrary to the cross-sectional nature of the former studies, this one used longitudinal survey data from 236 French girl handballers. The 3 perceptions were measured by a questionnaire at the beginning and the end of one season. In the middle of the season, perceptions of coaches' motivational climate were also evaluated. Results showed that at the end of the season, feelings of competence, autonomy, and relatedness were both positively predicted by a task-involving climate and negatively predicted by an ego-involving climate, even after controlling for the level of each variable at the beginning of the season.

Key Words: achievement climate, motivation, relatedness, competence, autonomy

Key Points:

- The influence of coach's task- and ego-involving climate on the satisfaction of the needs for competence, autonomy, and relatedness was examined.
- Contrary to the cross-sectional nature of the former studies, longitudinal survey data were used.
- Participants were 236 French girl handballers, aged 13-15 years, playing at a low level of competition.
- Results showed that a task-involving motivational climate increases, whereas an ego-involving climate undermines the three perceptions across 7 months.

Introduction

In France, as in many Western countries (e.g., 21, 23), a massive number of teenagers, particularly girls, drop out from sport every year. For example, 50% of Frenchwoman handball players, drop out between 13 and 15 years of age (13). Given the multiple benefits of regular physical activity, as revealed in many studies (see 16 for a review), it is unfortunate that a large number of children and teenagers terminate their participation in physical activity. If the goal is to increase the physical activity level of the teenage population, more research is needed with regard to factors related to their physical activity.

Motivation constitutes a key variable to look at when attempting to predict sport participation (20, 28) and dropout (24, 28). In this respect, self-determination theory (SDT; e.g., 8, 22) offers an explanatory

framework that is particularly interesting. This theory posits that an individual will be intrinsically motivated by an activity, when it allows the satisfaction of three basic human needs: competence, autonomy, and relatedness. The need for competence implies a propensity to have an effect on the environment as well as to attain valued outcomes within it (8, 27, 30). The need for autonomy concerns the experience of freedom -- a desire to engage in activities of one's own choosing and to be the origin of one's own behavior (7, 8, 27). Finally, the need for relatedness refers to the desire to be accepted by others -- to feel connected to others or to the feeling that one belongs to a given social milieu (4, 8, 27). People are theorized to be inherently desirous of feeling connected to others within their social milieu, of functioning effectively in that milieu, and of feeling a sense of personal initiative while doing so (8, 20).

Applied to the sport domain, this theory expects that perceptions of competence, autonomy, and relatedness lead an athlete to freely and long-lastingly re-engage in the activities in which these feelings were experienced (28). Indeed, several studies corroborated the importance of perceived competence (e.g., 31), relatedness (e.g., 25), and autonomy (see 29) for athletes' motivation. Therefore, knowing conditions which facilitate versus undermine these three fundamental perceptions in sport constitutes an important objective of research when one wishes to motivate individuals in sport for a long time.

SDT is specifically framed in terms of social and environmental factors that affect feelings of competence, autonomy, and relatedness and, in turn, intrinsic motivation (8, 22, 28). There are numerous social factors that can play an important role in shaping motivational mediators and motivation (for reviews, see 8, 22, 28). Among the particularly influential social agents in the sport domain, coaches' behavior seems to have a crucial impact on athletes' motivation (26, 29). Coaches design practice sessions, group children, give recognition, evaluate performance, share their authority, and shape the sport setting. In sum, they establish a motivational climate (1) that can have an important impact on athletes' motivation.

Task- and ego-involving dimensions of the coach's climate have been particularly studied recently (for reviews, see 9, 11, 20). These variables are related to achievement goal theory (AGT; 1, 17). The central tenet of AGT is that the goal of an individual is to strive to demonstrate competence in achievement contexts. The existence of two independent goals is now acknowledged. In the first case (labeled task involvement), the goal of the individual is to master tasks, to solve problems, or to make progress. In the second case (labeled ego involvement), the goal of the individual is to demonstrate a high ability or to avoid being perceived as incompetent.

AGT also generally considers that a person's goal in a particular setting is a function of situational and dispositional (task and/or ego orientation) factors. Situational factors, like a coach's behavior, can cause one to pursue a task or an ego goal (for a review, see 9). Emphasis on the learning process, investment, progress, and the promotion of cooperation among team members constitute examples of task-involving structures of the climate. By contrast, emphasis on competition where "winning is everything," mistakes are punished, reinforcement and attention are differentially provided as a function of ability level, and rivalry is fuelled among players of the same team -- constitute examples of an ego-involving climate. Generally past studies show (see for reviews, 9, 20) that when players perceive that the climate emphasizes task-involvement, then they are likely to display an adaptive pattern of cognition, affect, and behavior. In contrast, when players perceive the environment as emphasizing ego-involvement, then they are likely to display a non-adaptive pattern of cognition, affect, and behavior, except for the ones

who have a high perceived ability in the activity and who expect to demonstrate their superiority over the others.

In view of the aforementioned importance of perceived competence, autonomy, and relatedness for both intrinsic motivation and lasting commitment in sport, the purpose of the present study was to test coaches' task- and ego-involving climate on changes in perceived competence, relatedness, and autonomy among girl handballers. It was hypothesized that coaches' climate would influence athletes' perceptions of competence, relatedness, and autonomy. Because a task-involving climate highlights athletes' progress and effort, it thus maximizes the opportunities to feel more competent. By contrast, because an ego-involving climate focuses individuals on normative criteria and the adequacy of current ability level, it undermines maintenance of self-confidence over time, especially for the participants who already question their ability (20). Furthermore, the development of perceived autonomy is most likely when task involvement is encouraged, because this climate increases the perception that endeavoring to achieve is under one's personal control (10) -- it prompts a shift toward a more internal locus of causality. In contrast, when ego involvement is encouraged, perceived autonomy can decrease, because evaluation of one's performance is based on external normative criteria (17). Therefore, successful outcomes are less perceived as under a person's volitional control (10), and a shift toward a more external locus of causality is likely. Moreover, when an ego-involving climate is created, a feeling of pressure to maintain self-esteem is experienced, which can undermine perceived autonomy (8). Last, because an emphasis on team member cooperation, as well as a sense that each participant has an important role to play, are fundamental to a task-involving atmosphere (9), one can suppose that such a climate is conducive to perceptions of relatedness. In contrast, an ego-involving environment is characterized by the promotion of rivalry among team members and is related to less team cohesion.

In the end, it was hypothesized that the more ego involving the motivational climate instilled by the coach, the less positive will be athletes' perceptions of competence, relatedness, and autonomy. By contrast, the more task involving the climate is, the more positive such perceptions should be. A few past studies have supported this prediction. A positive connection was shown between a perceived task-involving climate on the one hand, and feelings of autonomy (e.g., 24), competence (e.g., 6, 18, 24), and relatedness (e.g., 5, 24) on the other hand. Besides, a negative connection was shown between a perceived ego-involving climate on the one hand, and feelings of autonomy (e.g., 24) and relatedness (e.g., 5) on the other hand.

If these studies provide some support for the hypothesis, they are also characterized by a strong limitation related to the cross-sectional nature of the research design. Indeed, it seems obvious that, at a contextual level (28), coach influence requires time to develop. Consequently, interpretation of such effects in cross-sectional designs may be problematic because concurrent measurement of variables precludes such effects from occurring (12). In this case, a longitudinal design including autoregressive influence was preferred (15).

Method

Participants and Procedure

Participants were 236 French female handball players between the ages of 13 and 15 years ($M = 14.00$ years, $SD = 0.81$ years), who were participating in an ongoing multi-troop longitudinal study. These athletes came from 60 different teams from a French league. They were ranked at the regional level and were training an average of 4 hours a week.

Data for this study were taken from surveys that were administered to players during the 1999-2000 competitive handball season. Three questionnaires were sent to 580 players at three points during the season. A postage-paid reply envelope was also provided. A letter accompanying each questionnaire explained that the purpose of the study was to know more about how female handball players reacted to their sporting experiment. It was clearly stated to participants that anonymity and confidentiality of their answers would prevail at all times. At the beginning of the season (Time 1, in October 1999), a questionnaire measuring perceptions of competence, autonomy, and relatedness was sent to players. The second questionnaire was sent towards the middle of the season (Time 2, in February 2000) and measured perceptions of coaches' motivational climate. The third questionnaire, identical to the first one, was sent close to the end of the season (Time 3, in May 2000). Only the data from players who responded to all three questionnaires were used in this study.

Measures

The format for all items was a 7-point Likert-type scale, ranging from 1 (*strongly disagree*) through 7 (*strongly agree*).

Perceived Competence. To assess perceived handball competence, a 4-item questionnaire (e.g., "I consider myself to be a good player"), adapted from the Perceived Competence in Life Domains Scale (PCLDS; 14), was used. PCLDS assesses perceptions of competence toward various life domains, including education and leisure, and has been found to be highly reliable and valid (see 14). In this study, Time 1 and Time 3 Cronbach alpha coefficients were 0.85 and 0.83, respectively.

Perceived Autonomy. To assess the participants' feeling of autonomy in the handball environment, a 3-item questionnaire (e.g., "I feel controlled at handball"; this scale used reverse scoring), adapted from the Perceived Autonomy Toward Life Domains Scale (PALDS; 3), was used. PALDS assesses one's perceptions of autonomy in different life domains, including education and leisure, and has been found to be reliable and valid (see 3). In this study, Time 1 and Time 3 Cronbach alpha coefficients were 0.69 and 0.71, respectively.

Perceived Relatedness. To assess perceived handball relatedness, a 4-item questionnaire (e.g., "I feel attached to the girls on my team"), adapted from the Feelings of Relatedness Scale (FRS; 19), was used. FRS assesses one's perceptions of relatedness in the work place, and has been found to be reliable and valid (see 19). In this study, Time 1 and Time 3 Cronbach alpha coefficients were 0.90 and 0.93, respectively.

Perceived Motivational Climate Emphasized By the Coach. Participants completed the modified French version of the Perceived Motivational Climate in Sport Questionnaire (PMCSQ), namely "L'Échelle de Perception du Climat Motivationnel" (EPCM; 2, 6). The PMCSQ is a scale developed by Duda and colleagues (see 9, 11) to assess players' perceptions of the degree to which their team's motivational climate was characterized by an emphasis on task or ego goals. Specifically, the French version of the PMCSQ is a 18-item questionnaire hierarchically ordered to assess the perceived motivational climate in terms of two higher order factors, namely: (a) task- and ego-involving climate, and (b) five lower order factors -- two assessing the task-involving climate and three assessing the ego-involving nature of the achievement context. Task-involving dimensions consist of items reflecting an emphasis on promotion of learning by a coach (e.g., "The coach encourages you to work on weaknesses") and pursuit of progress by athletes (e.g., "Players try to learn new skills"). Ego-involving

dimensions consist of items reflecting an athlete's desire to be compared to other athletes (e.g., "Players feel good when they do better than teammates"), worries about mistakes (e.g., "Players are afraid to make mistakes"), and limited recognition (e.g., "The coach pays most attention to the stars"). When completing the EPCM, the athletes were asked to respond by making reference to what it was like playing on their particular teams over the course of the season. In previous research, this scale has been found to be valid and reliable (2, 6, 24). For the purposes of the present study, the two higher order factors of the EPCM (namely task- and ego-involving climate) were utilized in all subsequent analyses. (Cronbach alpha coefficients for task- and ego-involving climate subscales were .88 and .78, respectively.)

Results

Means, standard deviations, and correlations among variables are shown in Table 1. As could be expected, perceived competence, autonomy, and relatedness at Time 3 were related to Time 1 scores. Also, as expected, the perception of a task-involving climate at Time 2 was positively related with all three motivational perceptions at Time 3. In contrast, the perception of an ego-involving climate at Time 2 was negatively related with all three variables at Time 3.

To examine the extent to which athletes' perceptions of motivational climate predicted changes in their perception of competence, autonomy, and relatedness, a series of hierarchical regression analyses was conducted. Separate analyses were realized for each of the three motivational variables, using the following procedure: The corresponding Time 1 score was entered first (step 1); perceptions of the task- and ego-involving climate at Time 2 were entered second (step 2).

Table 1 Descriptive Statistics and Zero-Order Correlations ($N = 236$)

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7
Perceived competence (T1)	4.76	1.37	—						
Perceived autonomy (T1)	4.69	1.16	.24***	—					
Perceived relatedness (T1)	5.50	1.25	.12	.31***	—				
Perception of a task-involving climate (T2)	5.23	1.05	.14*	.11	.33***	—			
Perception of an ego-involving climate (T2)	2.99	1.06	-.07	-.19**	-.17**	-.40***	—		
Perceived competence (T3)	4.79	0.95	.36***	.15*	.17**	.31***	-.29***	—	
Perceived autonomy (T3)	4.31	1.37	.09	.37***	.22***	.28***	-.32***	.22***	—
Perceived relatedness (T3)	5.73	1.33	.20**	.25***	.51***	.39***	-.38***	.38***	.21**

Notes. T1 = Time 1; T2 = Time 2; T3 = Time 3.

* $p < .05$; ** $p < .01$; *** $p < .001$.

This hierarchical approach to the analysis provided information about change in athletes' perception of competence, autonomy, and relatedness over the season in that their scores at the beginning of the season were controlled statistically. That is, the coefficients reported for the second step can be thought of as predicting residual variance of each interest variable, unexplained by their initial level. A third and fourth step were included in the analyses to check for the presence of two (task \times interest variable; ego \times interest variable; ego \times task) and three (task \times ego \times interest variable) interaction terms, after having standardized all the variables. As none of these interactions were significant, only the first two steps of the analyses were reported (Table 2).

The patterns of results are the same for the three analyses. At the first step, each interest variable (Time 3) was predicted by their Time 1 corresponding score, and accounted for 13% to 26% of the variable. When players' perceptions of the climate of their teams were added to the equation (Step 2), the three equations of multiple regression remain significant ($F_{3,229} = 22.56, 21.84, \text{ and } 43.53, p < .001$,

respectively, for perceived competence, autonomy, and relatedness). Moreover, perceptions of the task- and ego-involving climate accounted for an additional variance (9% to 11%; see Table 2). Each time, the perceptions of a task-involving climate positively predicted the change in interest variable (Beta = .16 to .19), and the perception of an ego-involving climate negatively predicted the change in interest variable (Beta = -.19 to -.32).

Table 2 Multiple Regressions Testing the Effects of Perceived Task- and Ego Involving Climate on Changes from T1 to T2 in Perceived Competence, Autonomy, and Relatedness ($N = 236$)

Variable	Perceived competence (T3)			Perceived autonomy (T3)			Perceived relatedness (T3)		
	β	B	t	β	B	t	β	B	t
Step 1:									
Corresponding T1 Score	.36	.35	5.86**	.37	.50	6.03***	.51	.67	8.93**
F (degrees of freedom)	34.30**	(1,231)		36.34**	(1,231)		79.80**	(1,231)	
R^2	.13			.14			.26		
Step 2:									
Corresponding T1 Score	.32	.31	5.45**	.32	.43	5.31**	.41	.55	7.73**
Perception of a task involving climate (T2)	.19	.18	2.97*	.17	.23	2.60*	.16	.21	2.67*
Perception of an ego involving climate (T2)	-.19	-.18	-2.97**	-.19	-.26	-2.96**	-.32	-.24	-4.18
F change (degrees of freedom)	14.66**	(2, 229)		12.74**			19.13**		
R^2 change	.10			.09	(2, 229)		.11	(2, 229)	
Total R^2	.23			.23			.37		

Notes. T1 = Time 1; T2 = Time 2; T3 = Time 3.

* $p < .01$; ** $p < .001$.

Discussion

The purpose of this study was to determine whether the perception -- that coaches' motivational climate is ego oriented or task oriented -- changes one's perceptions of competence, autonomy, and relatedness over one season. More precisely, it was hypothesized that a task-involving motivational climate facilitates perceptions of competence, autonomy, and relatedness, whereas an ego-involving climate undermines these qualities. Former studies have found a positive connection between the perception of a task-involving climate and feelings of autonomy (e.g., 24), competence (e.g., 6, 18, 24), and relatedness (e.g., 5, 24). Moreover, a negative connection has been found between the perception of an ego-involving climate and feelings of autonomy (e.g., 24) and relatedness (e.g., 5). However, the cross-sectional nature of these studies does not completely support the hypotheses insofar as the influence of the coach requires some amount of time to be influential. In other words, the motivational climate of the coach has to *change* feelings of competence, autonomy, and relatedness over time to truly support the hypotheses. That is why this study used a longitudinal design including autoregressive influence (15). Feelings of competence, autonomy, and relatedness were measured at the beginning and the end of one handball season, and perception of coaches' motivational climate was assessed in the middle of the season.

In accordance with the hypotheses, present findings demonstrate that at the end of the season feelings of competence, autonomy, and relatedness were both positively predicted by a task-involving climate, and negatively predicted by an ego-involving climate, even after controlling for the level of each variable 7 months previous, at the beginning of the season (i.e., the autoregressive influence; 15). By underlining the personal progress, sustained efforts, and sense that everyone on the team has an important role, the task-involving climate maximizes the opportunities to feel more competent, more autonomous, and more

connected with the others. By contrast, because an ego-involving climate focuses individuals on normative criteria -- the adequacy of current ability level, the worry about mistakes, and the rivalry among team members -- it undermines perceptions of competence, autonomy, and relatedness.

Although the present results provided support for the hypotheses, a limitation of this study is that the measures of coaches' climate were self-reported. Even if AGT (see 9), and SDT (see 8, 22, 27) stress the importance of individuals' perception of the social environment, future work should certainly include non-player-based assessments of the context in order to explore more fully what contributes to the athletes' perceptions of the social context. Moreover, this study was limited to adolescent girls playing handball at a low level of competition. The extent to which these results can be generalized to male handballers, to elite athletes and, more generally, to other types of sport and exercise, is unknown and should be empirically determined.

Conclusion

Adolescents, especially females, have been identified as an at-risk group for poor health due to their declining level of physical activity (e.g., 21, 23). Frenchwoman handball players are not exceptions to the rule; approximately 50% dropout between the ages of 13 and 15 (13). If the goal is to prevent teenagers from dropping out from sport and reducing exercise, then research is needed concerning the nature of the factors that facilitate attrition in sport and physical activity programs. Several researchers highlighted the importance of the fit between the motivational context provided by the coach and the socio-emotional needs of early adolescents (26, 28). The present findings showed that, when the climate instilled by the coach was ego involving, perceptions of competence, autonomy, and relatedness decreased. However, when the climate was task involving, perceptions of autonomy, competence, and relatedness were enhanced. As these three perceptions were shown to be positively connected with intrinsic motivation, which in turn is negatively connected to sport dropout (see 24, 28), such results might point to interventions that could increase adherence in sport. Key to such interventions is encouraging coaches to foster task-involving climates in order to help participants focus on the mastery dimensions of an activity, not extrinsic, "win at all costs" dimensions.

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