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Perceived motivational climate and cognitive and affective correlates among Norwegian athletes

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Based on Ames' conception of situational goal structures, the present study investigated whether achievement-related cognitions and affect were related to specific motivational climates. The participants were 148 experienced students in team sport at a Norwegian university who responded to a questionnaire on their perceptions of the motivational climate in their sport, use of learning strategies, satisfaction, sources of satisfaction and perceived purposes of participating in sport. Canonical correlation analysis revealed that the perception of the motivational climate as either mastery- or performance-involving was related to reporting of affect, achievement strategies and perceived purposes of sport in a conceptually consistent manner. Controlling for dispositional goals, regression analyses, in which the athletes' dispositional achievement goals were controlled, showed that perception of a performance-oriented climate emerged as a negative and unique predictor of satisfaction or interest in addition to the variance accounted for by ego orientation. Athletes who perceived the motivational climate as mastery-oriented endorsed mastery as a source of satisfaction, and were less inclined to report avoiding practice. In addition, athletes who perceived the climate as mastery-oriented believed that sport may develop lifetime skills. In contrast, perceiving the climate as performance-oriented was positively related to status as a perceived purpose of team sport. Our findings suggest that, when athletes perceive the sport climate as task-involving, it facilitates the adoption of adaptive learning strategies, the use of controllable criteria to determine satisfaction, and enhances perception of sport as being important for developing lifetime skills.

Keywords: achievement cognitions, affect, motivational climate.

Introduction

Recent research on motivation conducted in the educational and sport domain has focused on goal perspective theory (e.g. Ames, 1984, 1992; Nicholls, 1984, 1989; Duda, 1992; Roberts, 1992). According to this theory, in achievement contexts, individuals are motivated to attain success in the form of demonstrating competence or ability. However, the meaning of ability differs from person to person, and these different meanings affect the assessment of success and failure, and subsequent achievement behaviour. Two concepts of ability are assumed to manifest themselves in achievement contexts, namely an undifferentiated conception of ability, where ability and effort are not differentiated from each other and effort and ability are seen to co-vary, and a differentiated conception of ability, where ability and effort are differentiated - ability is seen as capacity and effort is seen as diminishing that capacity. These two conceptions of ability are fundamental to goal perspective theory. Individuals are assumed to adopt one or other conception or a combination of the two, and have the goal to demonstrate ability or competence according to the adopted conception of ability. Although there is variation in the labelling of the goals (e.g. Ames and Archer, 1988; Dweck and Leggett, 1988; Nicholls, 1989), we use Nicholls' terminology and define them as task and ego goal perspectives.

When being task-oriented, individuals have an undifferentiated concept of ability, are focused on developing new skills and trying to improve their competence,

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and are motivated when they experience success by achieving a sense of mastery based on self-referenced criteria. Effort is always present and is seen as a prerequisite of success. Ego-oriented individuals, by contrast, have a differentiated view of ability, are focused on surpassing normative-based standards and are motivated when they experience success by doing better than others. Furthermore, it is considered successful to achieve with little effort (Nicholls, 1984, 1989). The existence of goal perspectives and their relationship to achievement behaviours, cognition and strategies in sport and physical education contexts has been demonstrated by many researchers (for reviews, see Duda, 1992, 1993; Roberts, 1992, 1993; Roberts and Treasure, 1995).

Achievement goals have been investigated from two perspectives. It is argued that achievement contexts may make one concept of ability more salient than the other, or that individuals may be disposed to assess ability as being task- or ego-oriented. The literature in sport, however, has focused primarily on the relationship of dispositional goal orientations to achievement cognition, affect and behaviour (for reviews, see Duda, 1992, 1993; Roberts, 1992, 1993; Roberts and Treasure, 1995). The research that has focused on situational influences has investigated how the structure of the environment can influence a range of motivational variables (e.g. Butler, 1988; Nicholls, 1989; Ames, 1992; Goudas and Biddle, 1994; Treasure and Roberts, 1995). The premise of this line of research is that individuals interpret the goals of the situation to determine the degree to which task or ego involvement goals are perceived as salient. It is presumed that the dominant situational goal structure perceived by individuals will influence their cognition, affective states, attitudes and behaviours in achievement contexts (Nicholls, 1989; Ames, 1992; Seifriz *et al.*, 1992; Goudas and Biddle, 1994). This body of research has shown that, when the demonstration of ability is self-referenced and based on task-involving criteria - namely, improvement and effort, perceptions of autonomy, intrinsic motivation, positive affect - mastery at the task and the belief that performance and effort co-vary are facilitated. In contrast, when the structure of the context facilitates a focus on the demonstration of ability relative to others and ego-involving criteria, individuals have reported a lack of interest in the task or activity, decreased intrinsic motivation, negative affect and the belief that ability is the cause of success (Nicholls, 1989; Ames, 1992; Lloyd and Fox, 1992; Seifriz *et al.*, 1992; Papaioannou, 1995; Treasure and Roberts, 1995; Ommundsen and Bar-Eli, in press). The main focus of the present study was the influence of situational variables on certain motivation cognitions and affect.

Perceived motivational climate and cognitive and affective correlates

Jagacinski and Nicholls (1984) conducted one of the first studies into the influence of the motivational climate on conceptions of ability. Nicholls (1984) argued that a task involvement conception is likely to occur in situations that de-emphasize extrinsic incentives, reward improvement, and encourage or reward trying hard, whereas an ego involvement conception is likely to occur in situations characterized by social comparison of skills, interpersonal competition and winning. In particular, it has been suggested that an undifferentiated task structure, in which athletes are given little room for working on different tasks, may increase the visibility and perceived usefulness of social comparison leading to ego involvement (Rosenholtz and Simpson, 1984). Jagacinski and Nicholls (1984) supported this argument when they experimentally induced task and ego involvement and found that students, when confronted with the former, applied a self-referenced conception of ability. In ego involvement, students were more apt to use social comparison-based criteria. In addition, Ames and Archer (1988) found that students who perceived the motivational climate of the classroom as task-involving were more likely to have positive attitudes towards their classes. These students also were more likely to report using effective learning strategies and preferred tasks that offered a challenge than students who perceived the motivational climate as ego-involving. This pattern of results was also maintained when the effect of perceived ability on the use of effective learning strategies was controlled. Furthermore, students who perceived the achievement context as emphasizing a task-involving climate were more likely to believe in the efficacy of effort to achieve success. An ego-involving climate, by contrast, was found to have a weak or negative relationship to intrinsic motivation (Ames and Archer, 1988).

Using basketball players, Seifriz *et al.* (1992) found that the perception of a task-involving climate was positively related to reported enjoyment and to higher intrinsic motivation. In a similar study with adolescent team sport athletes, Walling *et al.* (1993) found that perceptions of a task-involving motivational climate were associated with greater satisfaction with being a team member. Similar results have been reported in the context of physical education (Papaioannou, 1994). Perceiving the climate as task-involving seems to correspond with the belief that ability is most likely to help players be successful in sport (Seifriz *et al.*, 1992), and to co-vary with negative attitudes towards physical education lessons (Papaioannou, 1994). The objective of the present study was to continue and extend this line of research.

Nicholls (1989) and Ames (1992) have argued that the motivational climate influences both cognitive and affective states. Therefore, as in previous research (Seifriz *et al.*, 1992; Walling *et al.*, 1993), we included an examination of the role of the perceived motivational climate upon satisfaction in sport, and the impact of the perceived motivational climate upon sources of satisfaction. Controlling for dispositional goal orientation, we hypothesized that athletes would report greater satisfaction in task-involving motivational climates. Athletes are more likely to meet the extant criteria of success, such as applying effort, in task-involving climates than athletes in ego-involving climates. Not all athletes can beat all other athletes, thus athletes in ego-involving contexts are generally less likely to experience satisfaction.

Controlling for goal orientation, we hypothesized that athletes would report the causes for their satisfaction in sport in accordance with their perception of the criteria of success considered to be salient in that context. The criteria perceived to be salient to satisfaction in the task-involving climate would be applying effort to learn new skills and making mastery attempts. On the other hand, athletes who viewed their sport as more ego-involving would derive satisfaction from sources such as finding playing easy, doing better than others and doing well without trying hard.

We also wished to extend previous research and investigate the achievement strategies used by athletes in task- and ego-involving climates. Previous research assessing dispositional goal orientations found that there is a consistent relationship between being task-oriented and the use of adaptive achievement strategies (such as practising more and emphasizing the value of practice to learn and improve). Similarly, a consistent relationship has been found between being ego-oriented and the use of maladaptive achievement strategies, such as avoiding practice (Lochbaum and Roberts, 1993; Roberts and Ommundsen, 1996). As the motivational climate focuses on specific achievement criteria, when we controlled for goal orientation, we expected that athletes perceiving the motivational climate as task-involving would be more likely to report using adaptive achievement strategies, such as seeking practice and viewing practice as an opportunity to learn more. In contrast, players who perceived the motivational climate to be ego-involving would be more likely to report using maladaptive achievement strategies, such as avoiding practice. Avoiding practice may reflect an achievement strategy used by athletes in a performance-oriented climate. Such a strategy may serve at least two purposes. First, avoiding practice may be triggered by a wish to prevent social comparisons of ability and thereby reduce the risk of highlighting lack of ability. Secondly, in a performance-oriented climate, athletes may shun additional practice to allow them to demonstrate more convincingly superior ability without having to work hard (Nicholls, 1984; Ames and Archer, 1988).

Another variable of interest in dispositional goal orientation research has been the purposes of sport (e.g. Duda, 1989; Roberts and Ommundsen, 1996). Being task- or ego-oriented affects one's 'world views' (Nicholls, 1989) about the meaning of involvement in the achievement context. Thus ego-oriented athletes view success in sport as a means of enhancing status, whereas task-oriented athletes view success in sport as a means of developing lifetime skills, such as social commitment, cooperative skills, enhancing fitness, lifelong interest in physical activity and increased health consciousness (e.g. Duda, 1989; Roberts *et al.*, 1995; Walling and Duda, 1995; Roberts and Ommundsen, 1996). In this study, we investigated the association of the motivational climate with perceived purposes of sport. When controlling for goal orientation, we expected that a perception of the climate as more task-involving would be associated with beliefs in sport as a means to develop prosocial competence (i.e. cooperate with others, learn to follow rules) as well as health-related lifetime skills. In contrast, we expected that when the perception of the motivational climate was more ego-involving, athletes would view the attainment of outcomes, such as social status and recognition, as an important reason for sport participation.

In line with other researchers who have investigated the interaction of dispositional achievement goals and the perception of the motivational climate (Nicholls, 1989; Roberts, 1992; Roberts and Treasure, 1995), we measured dispositional goals in this study. It has been argued that exposure to task- or ego-involving climates socializes the individual to adopt the extant criteria of success in that context (Nicholls, 1989; Ames, 1992). Thus, we expected that the athletes exposed to task-involving contexts would score higher in the task goal perspective, and athletes exposed to ego-involving contexts would score higher in the ego goal perspective.

This study extends previous work by investigating the role of the motivational climate upon cognitive and affective outcomes while controlling for dispositional achievement goals. Moreover, given the importance of cross-cultural validation in the area of motivation, this study extends motivational climate research to another cultural setting.

Methods

Participants

Students ($n = 148$) from the Norwegian University of Sport and Physical Education served as participants in

the study. Approximately equal numbers of male and female students participated (70 males, 78 females), who ranged in age from 19 to 26 years (mean = 21.2 years, $s = 1.6$). To be accepted into the University programme, students are expected to have demonstrated competence at some sport or physical activity. All of the students recruited for this study had extensive experience in team sports; their level of participation ranged from local elite sport clubs to the national team.

Procedure

All variables were assessed by a questionnaire which took about 25 min to complete and was administered to the participants in a classroom setting. The participants recorded their responses on a computer-scored sheet. Participation in the study was voluntary and all responses were anonymous. No problems were encountered in understanding the nature of the questions or completing the questionnaire.

Assessments

The students' ages, present and past sports involvement and level of participation were assessed at the beginning of the questionnaire. The remainder involved an assessment of the their cognition in team sport, including their perception of the motivational climate, goal orientations, satisfaction or interest, sources of satisfaction, achievement strategies and purposes of team sport. No particular team sport activity was specified for the participants. They were free to choose their particular team sport, but were requested to persist with the team sport selected throughout all of their responses.

Perceived Motivational Climate in Sport Questionnaire

To study the relationship between the students' perception of the motivational climate in team sport and the variables of interest, we used the Norwegian version of the Perceived Motivational Climate in Sport Questionnaire (Seifriz *et al.*, 1992; Walling *et al.*, 1993; Roberts and Ommundsen, 1996). The Norwegian version was developed by an extensive translation and back-translation process. The results of the factor analyses and the psychometric properties of this questionnaire have been reported elsewhere for the original English language version (Seifriz *et al.*, 1992; Walling *et al.*, 1993), and for the Norwegian language version applied to the same sample as that in the present study (Roberts and Ommundsen, 1996). When answering the questionnaire, participants were asked to think what it was like taking part in their particular team sport. The stem for each item was: 'On this team/in this team sport context I feel that . . .'. Throughout the study, responses to subscales were indicated on a 5-point Likert scale (from 'strongly agree' to 'strongly disagree').

Factor analysis of the Norwegian version of the questionnaire resulted in six factors with an eigenvalue above 1.00, which accounted for 62.8% of the variance (see Roberts and Ommundsen, 1996). For the purposes of the present study, the two factors accounting for most of the variance and which had an internal consistency alpha of at least 0.7 were used. The first subscale comprised five items (Cronbach's alpha = 0.86) and reflected a mastery-oriented climate; the second subscale also comprised five items (Cronbach's alpha = 0.77) and reflected a performance-oriented climate.

Throughout the study, we used mean factor scores as the variables for further analysis. Items had to have a minimum loading of 0.50 for inclusion in a factor. The items also had to load unambiguously (the difference between the highest loading and other loadings on any other factor being < 0.15) and reveal interpretability and conceptual clarity. Unambiguous loading ensures that factors are interpreted in terms of items that are unique to them.

Perception of Success Questionnaire

To assess the task and ego orientation in the domain of team sport, a Norwegian version of the Perception of Success Questionnaire (Roberts and Ommundsen, 1996) was used. When completing the questionnaire, the students were asked to think of when they felt most successful and respond to several items, reflecting task- and ego-referenced criteria. The Norwegian version of the questionnaire was developed by an extensive translation and back-translation process. The results of the factor analysis and the psychometric properties of the Norwegian version of the questionnaire, applied to the same sample as that in the present study, have been reported elsewhere (Roberts and Ommundsen, 1996). The factor analysis of the Norwegian version revealed two clearly predominant and distinct sets of items conceptually consistent with the original American version, and had acceptable internal consistency. The study of Roberts and Ommundsen (1996) also revealed a third factor consisting of two of the original task orientation items. This factor, however, was not used for further computations due to low internal consistency. The Norwegian version of this questionnaire used in the present study consisted of a six-item ego orientation scale (Cronbach's alpha = 0.79) and a four-item task orientation scale (Cronbach's alpha = 0.81).

Satisfaction interest (SI)

Students were asked to respond to eight items based on the research of Duda and Nicholls (1992), which assessed their degree of intrinsic satisfaction with, and interest in, team sport. Factor analysis of the original scale revealed two reliable factors, labelled satisfaction enjoyment (five items) and boredom (three items). Factor analysis of the responses to these items in the present study resulted in a one-factor solution (eigenvalue = 4.3) which accounted for 54.4% of the variance, with all of the eight items loading within the range −0.61 to 0.80 (all of the negative loadings involved items that focused on boredom). However, to be consistent with previous research (i.e. Duda and Nicholls, 1992; Lochbaum and Roberts, 1993), we split the scales into satisfaction/interest and boredom. The boredom scale, however, showed an unacceptably low alpha and was omitted from further analysis. Consequently, the five satisfaction/enjoyment items comprised the scale used in the present study. The internal consistency of this scale was satisfactory (Cronbach's alpha = 0.86).

Sources of satisfaction/interest (SSI)

Perceived sources of satisfaction in team sport were determined by three subscales based on the work of Treasure and Roberts (1994). This measure consisted of 11 items reflecting three commonly experienced sources of satisfaction in sport. The stem for the subscale was: 'I feel very satisfied in team sport when I . . .'. The items relate to task- versus ego-involving sources of satisfaction/interest in sport, and satisfaction/interest derived from social approval from coach and peers in general (an example of the latter is: 'I feel satisfied in team sport when I please my coach, my friends'). An example of a task-involving source is deriving satisfaction from personal mastery/learning, whereas an ego-involving source of satisfaction includes winning, doing better than others, or feeling proud about success having expended little effort.

Generally, the results of the factor analysis confirmed the structure of the original subscales. Factor analysis of the 11 items resulted in four factors with an eigenvalue above 1.00. Orthogonal and oblique rotations produced very similar loadings and the inter-factor correlations were all very low. Consequently, the orthogonal rotation results were retained. Factor 1 accounted for 28% of the variance (eigenvalue = 3.07) and consisted of five items reflecting a mastery-oriented source of satisfaction, with loadings ranging from 0.50 to 0.87 (Cronbach's alpha = 0.80). Factor 2 accounted for 18% of the variance (eigenvalue = 2.0) and consisted of two items with loadings of 0.80 and 0.84, reflecting a sense of satisfaction derived from showing better ability (i.e. finding playing easy and doing well without trying hard) (Cronbach's alpha = 0.70). Factor 3, which contained items reflecting satisfaction derived from pleasing the coach and friends and one item reflecting satisfaction derived from normative ability, was omitted from further analysis due to unacceptably low alpha scores (Cronbach's alpha = 0.59). On factor 4, only one item loaded and thus it was omitted from further analysis. Consequently, in the present study, sources of satisfaction consisted of two factors reflecting task-oriented and ego-oriented sources of satisfaction.

Achievement strategies

To record data concerning students' achievement strategies, 20 items were used, which focused on achievement strategies towards practice and competition based on questionnaires in previous studies (i.e. Lochbaum and Roberts, 1993; Roberts and Ommundsen, 1996). Factor analysis with both varimax and oblique rotation resulted in six factors with eigenvalues above 1.00, accounting for 66.1% of the variance. Orthogonal and oblique rotations produced very similar loadings and the inter-factor correlations were all very low. Consequently, the orthogonal rotation results were retained. Factor 5 (a one-item factor) and factors 4 and 6 (unacceptably low internal consistencies) were not used for further analysis. The first factor accounted for 24.3% of the variance (eigenvalue = 4.6) and consisted of six items (loadings ranged from 0.85 to 0.53) reflecting a negative attitude towards practice in team sport; this factor was labelled 'avoid practice' (Cronbach's alpha = 0.84). The second factor accounted for 15.9% of the variance (eigenvalue = 3.1) and consisted of three items (loadings ranging from 0.78 to 0.64) reflecting an understanding of practice to be important for learning and improvement and reflecting a willingness to continue practising; this factor was labelled 'learn from practice' (Cronbach's alpha = 0.69). Factor 3 accounted for 7.5% of the variance (eigenvalue = 1.4) and contained two items, the first reflecting the belief that additional practice is necessary to improve (loading = 0.87) and the second reflecting that one seeks additional practice (loading = 0.79); this factor was labelled 'seeking practice' (Cronbach's alpha = 0.82).

Purposes of team sports

Based on the measure of Duda (1989), a factor analysis was conducted on the 18 items reflecting the following reasons for being involved in team sports: social status, social responsibility and lifetime health. Orthogonal and oblique rotations produced very similar loadings

and the inter-factor correlations were all very low. Consequently, the orthogonal rotation results were retained. Fifteen items initially met the aforementioned criteria for acceptance in the analysis. These items loaded on four factors, which accounted for 56.3% of the variance with an eigenvalue above 1.00. Factors 3 (three items) and 4 (two items) were, however, not used in subsequent analyses due to unacceptably low internal consistencies (factor 3, Cronbach's alpha $=0.61$) and lack of interpretability (factor 4, Cronbach's alpha $=0.35$). Consequently, two subscales reflecting different purposes of team sport were used in the present study. The first subscale, accounting for 27.8% of the variance (eigenvalue $=5.1$), consisted of seven items (loadings ranging from 0.75 to 0.50) reflecting the belief that participation in team sport contributes to the development of lifetime skills (Cronbach's alpha $=0.77$). The second subscale, accounting for 14.3% of the variance (eigenvalue $=2.6$), consisted of five items (loadings ranging from 0.76 to 0.67) focused on social status-related purposes of team sport (e.g. 'Make me look and feel important in front of other people') (Cronbach's alpha $=0.81$).

Results

Descriptive statistics

Means and standard deviations of motivational climate, goal orientations, satisfaction, sources of satisfaction, achievement strategies and purposes of team sport are presented in Table 1. This sample of athletes perceived a high mastery motivational climate in their team sport, were generally highly task-oriented and moderately ego-oriented. Furthermore, they were satisfied with participating in their team, derived satisfaction primarily from mastery experiences, and tended to endorse practice as an achievement strategy.

Correlation analyses

Pearson product-moment correlations were computed between perceptions of mastery and performance motivational climates and goal orientations, satisfaction/interest, sources of satisfaction, achievement strategies and beliefs about the purposes of team sport (Table 2). A consistent pattern of relationships between perceptions of motivational climate and cognitive and affective responses emerged; the magnitude of the correlations was low to moderate. Perceptions of a mastery motivational climate were positively related to task orientation, satisfaction derived from mastery, a willingness to learn from practice and the view that the purpose of team sport is to teach lifetime skills. Perceptions of a mastery climate were also inversely related to practice avoidance; perceptions of a performance climate were positively linked both with the view that the purpose of team sport is to enhance one's social status and with ego orientation, and negatively related to satisfaction/interest.

Canonical correlations

We conducted canonical correlational analysis to investigate the multivariate relationship between per-

Table 1 Descriptive statistics

Variable	Mean	*s*
Motivational climate		
mastery climate	4.15	0.75
performance climate	2.87	0.87
Goal orientations		
task orientation	4.69	0.47
ego orientation	3.63	0.79
Satisfaction/interest	4.56	0.59
Sources of satisfaction		
mastery	4.65	0.43
superior ability	2.55	0.91
Achievement strategies		
avoid practice	1.79	0.72
learn from practice	4.18	0.73
seeking practice	3.59	1.13
Purposes of team sport		
Lifetime skills	3.83	0.63
Status	3.30	0.83

Table 2 Zero-order correlations between motivational climate and goal orientations, satisfaction, sources of satisfaction, achievement strategies and purposes of team sport

Variable	Mastery climate	Performance climate
Goal orientations		
task orientation	0.37***	-0.01
ego orientation	0.07	0.16*
Satisfaction/interest	-0.08	-0.18*
Sources of satisfaction		
mastery	0.40***	-0.08
superior ability	0.11	0.04
Achievement strategies		
avoid practice	-0.24**	0.11
learn from practice	0.23**	-0.04
seeking practice	0.10	0.05
Purposes of team sport		
Lifetime skills	0.32***	-0.06
Status	0.02	0.22**

* $P<0.05$, ** $P<0.01$, *** $P<0.001$.

Table 3 Canonical loadings: Perceived motivational climate with goal orientations, satisfaction, sources of satisfaction, achievement strategies and purposes of team sport

	Function 1	Function 2
Criterion variables		
Motivational climate		
mastery climate	0.996	-0.086
performance climate	-0.036	0.999
Predictor variables		
Goal orientations		
task orientation	0.668	0.014
ego orientation	0.154	0.470
Satisfaction/interest	-0.164	-0.509
Sources of satisfaction		
mastery	0.707	-0.176
superior ability	0.209	0.136
Achievement strategies		
avoid practice	-0.403	0.296
learn from practice	0.414	-0.091
seeking practice	0.184	0.161
Purposes of team sport		
Lifetime skills	0.571	-0.123
Status	0.071	0.623

ceived motivational climate and goal orientations, satisfaction, sources of satisfaction, achievement strategies and beliefs about the purposes of team sport (see Table 3). Two significant canonical functions emerged (Wilks' lambda = 0.60; canonical correlations of 0.56 and 0.36 for functions 1 and 2, respectively). Function 1 had a high positive loading for perceptions of mastery climate and a low negative loading for perceptions of performance climate. As seen in Table 3, mastery climate was positively and strongly related to task orientation, to mastery as a source of satisfaction, to learning from practice and to the view that the purpose of team sport is to teach lifetime skills. Perceptions of mastery climate were inversely related to practice avoidance. An item had to load at least 0.30 on any one function to be considered significant (Tabachnick and Fidell, 1989). The second canonical function had a high positive loading for perceptions of performance climate and a low loading for perceptions of mastery climate, revealing a strong performance motivational climate. This performance climate was inversely related to satisfaction experienced during participation in the activity, and positively linked to ego orientation and the belief that the purpose of sport is to enhance one's social status.

The strength of the relationship between the criterion and the predictor variables can be observed using the redundancy statistic, with a redundancy value of 10% or greater being considered significant (Pedhazur, 1982; Tabachnick and Fidell, 1989). This statistic indicated that perceived motivational climate accounted for 28% of the variance in participants' cognitive and affective responses (functions 1 and 2 accounted for 17 and 11% of the variance, respectively).

Regression analyses

We conducted a series of regression analyses to determine whether motivational climate accounts for a unique amount of variance in cognitive and affective responses beyond that accounted for by dispositional goal orientations. We used the *test* method of the SPSS statistical program, which calculates the amount of unique variance in criterion variables accounted for by the predictors regardless of their order of entry into the regression equation.

Performance climate emerged as a negative predictor of satisfaction experienced during participation in team sport, whereas ego orientation was a positive predictor of satisfaction. With regard to mastery as a source of satisfaction, mastery climate contributed a significant amount of unique variance beyond that accounted for by task goal orientation, while ego orientation was the only significant predictor of ability as a source of satisfaction. These findings are presented in Table 4.

Mastery motivational climate was a negative predictor of practice avoidance, and the only variable that

Table 4 Percentage of unique variance in satisfaction and sources of satisfaction accounted for by the variables

Variable	β	R^2Ch	F	P
Satisfaction				
Mastery climate	-0.16	0.02	3.20	N.S.
Performance climate	-0.22	0.05	7.32	0.01
Task orientation	0.11	0.01	1.62	N.S.
Ego orientation	0.16	0.03	3.90	0.05
Mastery as source of satisfaction				
Mastery climate	0.23	0.05	9.60	0.01
Performance climate	-0.06	0.00	0.69	N.S.
Task orientation	0.42	0.15	31.17	0.001
Ego orientation	0.08	0.01	1.37	N.S.
Superior ability as source of satisfaction				
Mastery climate	0.14	0.02	2.37	N.S.
Performance climate	0.03	0.00	0.11	N.S.
Task orientation	-0.09	0.01	1.08	N.S.
Ego orientation	0.20	0.04	5.81	0.05

Note: total $R^2 = 0.078$, $F_{4,143} = 3.03$, $P < 0.05$, for satisfaction; total $R^2 = 0.319$, $F_{4,143} = 16.78$, $P < 0.001$, for mastery as source of satisfaction; total $R^2 = 0.060$, $F_{4,143} = 2.30$, $P > 0.05$, for ability as source of satisfaction.

accounted for a significant amount of unique variance in this construct, while task orientation positively predicted learning from practice as an achievement strategy. Finally, ego orientation positively predicted seeking practice as an achievement strategy (see Table 5).

As shown in Table 6, mastery climate accounted for a significant amount of unique variance in the belief that the purpose of sport is to teach one lifetime skills. Ego orientation also emerged as a significant predictor of this construct. With regard to the belief that the purpose of sport is to enhance one's social status, both performance climate and ego orientation contributed a significant amount of unique variance.

Table 5 Percentage of unique variance in achievement strategies accounted for by the variables

Variable	β	R^2Ch	*F*	*P*
Avoid practice				
Mastery climate	-0.20	0.03	5.21	0.05
Performance climate	0.06	0.00	0.61	N.S.
Task orientation	-0.11	0.01	1.57	N.S.
Ego orientation	0.15	0.02	3.51	N.S.
Learn from practice				
Mastery climate	0.16	0.02	3.45	N.S.
Performance climate	-0.02	0.00	0.04	N.S.
Task orientation	0.19	0.03	5.02	0.05
Ego orientation	-0.02	0.00	0.04	N.S.
Seeking practice				
Mastery climate	0.05	0.00	0.27	N.S.
Performance climate	0.03	0.00	0.13	N.S.
Task orientation	0.11	0.01	1.70	N.S.
Ego orientation	0.19	0.03	5.03	0.05

Note: total $R^2 = 0.094$, $F_{4,143} = 3.70$, $P < 0.01$, for avoid practice; total $R^2 = 0.087$, $F_{4,143} = 3.43$, $P < 0.05$, for learn from practice; total $R^2 = 0.060$, $F_{4,143} = 2.27$, $P > 0.05$, for seeking practice.

Table 6 Percentage of unique variance in purposes of team sport accounted for by the variables

Variable	β	R^2Ch	*F*	*P*
Lifetime skills				
Mastery climate	0.26	0.06	9.33	0.01
Performance climate	-0.05	0.00	0.44	N.S.
Task orientation	0.13	0.01	2.40	N.S.
Ego orientation	0.18	0.03	5.13	0.05
Status				
Mastery climate	0.03	0.00	0.11	N.S.
Performance climate	0.18	0.03	5.06	0.05
Task orientation	-0.01	0.00	0.02	N.S.
Ego orientation	0.26	0.06	10.32	0.01

Note: total $R^2 = 0.151$, $F_{4,143} = 6.38$, $P < 0.001$, for lifetime skills; total $R^2 = 0.115$, $F_{4,143} = 4.63$, $P < 0.01$, for status.

Discussion

Several results from the present study support predictions stemming from goal perspective theory (e.g. Nicholls, 1984, 1989; Ames, 1992; Duda, 1992; Roberts, 1992) by showing that the perception of the motivational climate is related in a conceptually meaningful manner to achievement cognitions and affect. The perception of a task-involving motivational climate in sport was related positively to a dispositional task goal orientation and deriving satisfaction from task-involving sources such as mastery, progress and learning. Furthermore, athletes perceiving the situational goal structure to be highly mastery-oriented reported functional achievement strategies, such as a willingness to learn from practice as well as to continue practising. They were also inclined to report sport involvement as being important for the development of lifetime skills, such as increasing health awareness and long-term interest in sport. In contrast, athletes who perceived the motivational climate to be more performance-oriented were primarily ego-oriented, they derived less satisfaction from sport, tended to avoid practice and viewed sport primarily as a means to enhance social status and recognition.

With a few exceptions (e.g. Seifriz *et al.*, 1992), most previous research has examined the effects of dispositional goals and the perceived situational goal structure in sport upon cognitions, achievement strategies and affect separately. Following the approach taken by Seifriz *et al.*, we examined the unique effect of the situational climate upon motivational cognitions and affect, controlling for dispositional goals.

Satisfaction/interest

The perception of a performance-oriented climate emerged as a negative and unique predictor of reported satisfaction in sport in addition to the variance accounted for by a high score on ego goal orientation. However, the amount of variance in reported satisfaction accounted for by the goal orientation was modest at only 5%. One can speculate that this may be a result of some of the athletes being high in both task and ego goal orientation (Fox *et al.*, 1994). Nevertheless, this suggests that when athletes perceive their coach as creating a climate characterized by interpersonal competition where athletes try to surpass each other, this results in decreased satisfaction and interest. The

results are consistent with previous research (Seifriz *et al.*, 1992) that has shown that athletes who perceived a performance-oriented climate reported decreased levels of enjoyment and increased levels of pressure and tension. A performance-oriented climate focuses upon superior ability and surpassing others. Athletes have little control in creating the climate. Thus, they may be less satisfied because they have to be concerned about performing at a level below others. The motivational implications of this finding should be interpreted with caution, however, given that the unique variance in reported satisfaction accounted for in the perceived performance-oriented climate was low.

One unexpected result emerged: whereas a performance-oriented climate negatively influenced reported satisfaction, an ego goal orientation positively predicted this affective state. A possible explanation may be derived from Self-Determination Theory (Deci and Ryan, 1985). Feelings of self-determination and autonomy positively influence enjoyment and satisfaction. One could speculate that being ego-oriented does not reduce feelings of self-determination and positive affect, whereas perceiving that others (i.e. coaches) induce a performance-oriented climate may be interpreted as controlling, leading to a lower sense of autonomy and reduced intrinsic satisfaction. This issue requires further research.

Sources of satisfaction/interest

Task orientation was shown to be the strongest predictor of reporting mastery as a source of satisfaction. However, perceiving the motivational climate as mastery-oriented also emerged as a predictor of mastery as a source of satisfaction. The results suggest that, in contexts that emphasize and reward personal progress, individuals report feeling satisfied when they exert effort, improve skills and achieve their personal best. Apparently, these athletes derive satisfaction not only from sources consistent with their dispositional goals, but also from the goal structure created by the coaches in the sport context. This lends support to goal perspective theory, which predicts that cognitions in achievement contexts are a function of the interplay between dispositional goals and features of the situational goal structure (Nicholls, 1989; Ames, 1992). Moreover, it suggests that task-involved athletes develop sources of satisfaction that are more under personal control within a mastery-oriented climate.

Achievement strategies

The development of a positive attitude towards practice is a precondition for athletic success. The results of this study show that avoiding practice is negatively related to the perception of the climate as being mastery-oriented. Our findings parallel previous research (e.g. Ames and Archer, 1988) that has demonstrated a link between a mastery-oriented climate and effective learning strategies in the classroom, and suggest that a mastery-oriented motivational climate is important for the development of adaptive achievement strategies in sport. A number of explanations have been offered for the advantage of a mastery-oriented motivational climate. First, it seems to help people believe in the efficacy of effort (Bandura and Shunk, 1981). Secondly, viewing errors as a part of learning has been found to be embedded in a mastery-oriented goal structure. This, in turn, may prevent athletes from engaging in self-protective behaviours, such as withdrawal of effort (e.g. Dweck, 1986; Ames and Archer, 1988). Thirdly, a task-involving climate seems to result in a more task-focused allocation of information-processing resources, in that athletes are more goal-directed while monitoring and reflecting upon personal performance in practice. This may facilitate learning (Graham and Golan, 1991; Thill and Brunel, 1995). Stated differently, a performance-oriented atmosphere may interfere with the athletes' attention, concentration and effective strategy deployment on the task by increasing their anxiety regarding goal failure (Carver *et al.*, 1983). As a consequence of being in a climate which facilitates learning, athletes may be able to appreciate the benefits of sustained practice.

Our results suggest that coaches may be able to sustain motivation for practice by directing their rewards towards effort, hard work and personal progress. These are factors over which the athletes have control. In turn, having a sense of being in control of their own achievement may affect the willingness of athletes to persist in practice. During unfavourable social comparisons with the achievement of others, this may be particularly important. Endorsing practice as a means to improve physical skills, and persisting in the face of obstacles, have important implications for long-term sport achievement. To fully develop talent and skills and perform at the highest possible level, all athletes need to devote considerable time and effort to practice, particularly during periods of temporary setbacks, such as when returning from injury.

Variations in dispositional goals were not associated with practice avoidance once individual differences in perception of the motivational climate were taken into consideration. Thus, irrespective of the athletes' dispositional achievement goals, it may be important to create a task-oriented goal structure to prevent athletes from shunning practice.

Purposes of team sport

Previous research has shown that goal orientations are linked to one's world views (e.g. Nicholls *et al.*, 1985; Roberts and Ommundsen, 1996) as well as perceived purposes of training (Ommundsen and Roberts, 1996). In this study, an ego orientation was significantly related to the view that sport is a means to develop lifetime skills, not a finding we expected. A high task orientation, on the other hand, was not related to lifetime skills. More importantly, however, perception of the climate as mastery-oriented emerged as the main predictor of a high score on lifetime skills when the effect of dispositional goals was partialled out. Parallel to this finding, when controlling for the effect of an ego-oriented achievement goal, athletes who perceived the sport climate to be performance-oriented were significantly more apt to report status as a purpose of sport.

Previous research in sport, physical education and other contexts has shown that dispositional achievement goals relate in a consistent manner to the perceived purposes of involvement in those particular contexts (e.g. Duda, 1989; Nicholls, 1989; Papaioannou and Macdonald, 1993; Papaioannou, 1994; Roberts and Ommundsen, 1996). The results of the present study suggest that, in addition to the role of dispositional achievement goals, the perception of the motivational climate also plays an important role in shaping the views of people regarding the social value of being involved in sport.

It has long been advocated that we create task-involving environments to focus athletes, especially young athletes, on personal skill improvement and mastery of tasks (e.g. Roberts, 1984). But the present research also suggests that it is desirable and beneficial to establish a task-involving climate for adult athletes taking part in competitive sport. A task-involving climate was associated with desirable achievement strategies and beliefs and with reporting lifelong commitment to physical activity. An ego-involving climate, on the other hand, was not associated with desirable achievement strategies, but was associated with seeking status as a purpose of sport.

From an educational perspective, it seems more appropriate to create a task-involving motivational climate and focus the attention of athletes on personal skill improvement. Learning to derive satisfaction from personal progress and focusing on adaptive achievement strategies is essential to the fulfilment of an athlete's potential. In contrast, when feelings of satisfaction depend on how one compares with others, athletes are more likely to engage in constant competition with team mates and opponents. This, in turn, may lead to the development of maladaptive achievement strategies and beliefs. From a motivational perspective, it is more desirable for athletes to encounter task-involving motivational climates to develop adaptive achievement behaviours and beliefs.

There are some limitations to the present study. First, several of the relationships obtained were not particularly strong. One must be cautious in interpreting the findings when the variances accounted for were modest, albeit significant. It appears that there may be cultural differences with respect to achievement-related cognitions and affect which may not be considered through an extensive process of translation and back-translation. The fact that the Norwegian versions of the Perceived Motivational Climate in Sport Questionnaire and Perception of Success Questionnaire revealed a different factor structure than the originals (Roberts and Ommundsen, 1996), clearly underlines the need for further validity work on the Norwegian instruments.

Conclusion

Our results suggest that the perception of the motivational climate as task-involving has a positive and unique influence on the cognition and affect of Norwegian athletes. However, we also support the interactionist approach to the study of motivation in sport. Both dispositional goals and the situational context need to be taken into consideration to understand the cognitions and beliefs that underlie the process of motivation in sport.

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