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Predicting athletes' functional and dysfunctional emotions: The role of the motivational climate and motivation regulations

MONTSE C. RUIZ[1], SAARA HAAPANEN[1], ASKO TOLVANEN[2], CLAUDIO ROBAZZA[3] & JOAN L. DUDA[4]

[1]Faculty of Sport and Health Sciences, University of Jyväskylä, Finland; [2]Department of Psychology, University of Jyväskylä, Finland; [3] BIND-Behavioral Imaging and Neural Dynamics Center, Department of Medicine and Aging Sciences, "G. d'Annunzio" University of Chieti-Pescara, Italy; [4]School of Sport, Exercise and Rehabilitation Sciences, University of Birmingham, UK

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Corresponding author:
Montse Ruiz, PhD
Faculty of Sport and Health Sciences
P.O. Box 35 (Viveca)
FI-40014 University of Jyväskylä, Finland
Tel: +358 40 80 53 969
Email: montse.ruiz@jyu.fi

Abstract

This study examined the relationships between perceptions of the motivational climate, motivation regulations and the intensity and functionality levels of athletes' pleasant and unpleasant emotional states. Specifically, we examined the hypothesised mediational role of motivation regulations in the climate-emotion relationship. We also tested a sequence in which emotions were assumed to be predicted by the motivational climate dimensions and then served as antecedents to variability in motivation regulations. Participants (N = 494) completed a multi-section questionnaire assessing targeted variables. Structural equation modelling revealed that a perceived task-involving climate was a positive predictor of autonomous motivation and of the impact of functional anger, and a negative predictor of the intensity of anxiety and dysfunctional anger. Autonomous motivation was a partial mediator of perceptions of a task-involving climate and the impact of functional anger. An ego-involving climate was a positive predictor of controlled motivation, and of the intensity and impact of functional anger and the intensity of dysfunctional anger. Controlled motivation partially mediated the relationship between an ego-involving climate and the intensity of dysfunctional anger. Good fit to the data also emerged for the motivational climate, emotional states, and motivation regulations sequence. Findings provide support for the consideration of hedonic tone and functionality distinctions in the assessment of athletes' emotional states.

Keywords: sport motivation, emotional states, self-determination theory, achievement goal theory, IZOF model

Introduction

Considerable research has focused on the description of athletes' emotional states with the aim to understand their relationship with performance (for review, see Hanin, 2007; Lane, 2008). However, the study of the motivational antecedents of performance-related emotions has received less attention. Within achievement contexts, motivational processes are assumed to influence athletes' cognitions, actions and emotional responses (Deci & Ryan, 2000). Variations in motivation are determined by individual characteristics (e.g., athletes' dispositions, beliefs), and social environmental factors (e.g., coach behaviours) can play a significant role. Thus, it is important to understand the interplay between environmental factors, motivation, and athletes' performance-related emotional states and their impact on performance.

One motivation theory, which considers the features of the social environment and their implications for individuals' emotional and motivation-related responses within the social environment in question, is achievement goal theory (AGT; Ames, 1992; Nicholls, 1989). AGT assumes that the social situation created by significant others, such as coaches, influences goal involvement and how participants interpret their experiences and think, feel and behave in that setting. AGT distinguishes between task-involving and ego-involving achievement environments (Ames, 1992; Ames & Archer, 1988). In sport, athletes perceive a task-involving climate in situations in which a coach emphasizes improvement, effort, cooperation, and learning. In contrast, when a coach tends to provide normative-based feedback, disparages poor performance and mistakes, and gives particular attention and recognition to high-ability team members, the climate created is likely to be viewed as ego-involving (Newton, Duda, & Yin, 2000).

Substantial empirical evidence indicates that perceptions of a task-involving climate are associated with a more adaptive achievement pattern (Duda & Balaguer, 2007). For instance, research has shown that a task-involving climate is positively

linked to athletes' needs satisfaction, physical self-worth, effort, adaptive achievement strategies, and lower propensity to burn out in sport (Álvarez, Balaguer, Castillo, & Duda, 2012; Ommundsen, Roberts, & Kavussanu, 1998; Sarrazin, Vallerand, Guillet, Pelletier, & Cury, 2002; Vazou, Ntoumanis, & Duda, 2006). In contrast, perceptions of an ego-involving climate are associated with a more maladaptive achievement pattern. Specifically, a perceived ego-involving climate has been related to maladaptive achievement patterns, such as antisocial behaviour, perfectionistic concerns, greater peer conflict, and dropping out of sport (Bortoli, Messina, Zorba, & Robazza, 2012; Ommundsen, Roberts, Lemyre, & Millers, 2005; Sarrazin et al., 2002).

Research has also shown that the task- and ego-involving features of the motivational climate are related to differential athletes' emotional responses. Perceptions of a task-involving climate have corresponded to pleasant states, enjoyment, satisfaction with performance, and satisfaction with the team (Boixados, Cruz, Torregrosa, & Valiente, 2004; Bortoli et al., 2012; Smith, Balaguer, & Duda, 2006). In contrast, an ego-involving climate has been associated with unpleasant states, higher levels of competitive anxiety, performance worry, and dissatisfaction (Abrahamsen, Roberts, Pensgaard, & Ronglan, 2008; Bortoli et al., 2012; Pensgaard & Roberts, 2000; Vazou et al., 2006). In regard to more causal evidence, athletes who played for coaches who had received task-climate (mastery) training reported decreased anxiety through the season in contrast to the athletes of coaches who had not received such training (Smith, Smoll, & Cumming, 2007).

Another leading theory of motivation that differentiates the individuals' regulatory processes is self-determination theory (SDT; Deci & Ryan, 1985, 2000). According to SDT, motivation has been conceptualized as a multidimensional construct that can be divided into different forms of motivation (or reasons for engagement) that vary in their degree of self-determination. There are five different types of behavioural

regulations lying on a continuum from intrinsic to extrinsic motivation: (a) intrinsic motivation, the most self-determined, occurs when an athlete participates in sport because of enjoyment or interest in the activity itself; (b) integrated regulation is reflected when an athlete views sport as personally important, and his/her participation is in harmony with other deeply held beliefs and values; (c) identified regulation is exhibited when an athlete values the participation or the outcomes of a sport; (d) introjected regulation is manifested when an athlete participates in sport to avoid guilt or feelings of shame; and (e) external regulation, the least self-determined, which is manifested when an athlete participates to avoid punishment, obtain rewards, or satisfy an external demand. Most self-determined or autonomous forms of motivation are intrinsic motivation, identified and integrated regulations, while less self-determined and more controlled forms of motivation are external and introjected regulations. A lack of any motivation has been referred to as amotivation (Deci & Ryan, 1985; Ryan & Deci, 2000).

Research has revealed perceived task-involving climate to be a positive predictor of more self-determined styles of motivation (Kipp & Amorose, 2008; Sproule, Wang, Morgan, NcNeill, & McMorris, 2007; Standage, Duda, & Ntoumanis, 2003). In contrast, perceptions of an ego-involving climate have been found to positively relate to both indices of extrinsic motivation and amotivation (Bortoli, Bertollo, Filho, & Robazza, 2015; Jaakkola, Yli-Piipari, Barkouris, & Liukkonen, 2016; Ommundsen, Lemyre, Abrahamsen, & Roberts, 2010).

Motivational processes play an important role in producing different emotional responses (Vallerand, 1997). For instance, intrinsically motivated individuals tend to experience pleasant emotions (i.e., joy), whereas extrinsically motivated persons likely feel unpleasant emotions (i.e., anxiety). In the sport literature examining the interplay between motivation regulations and emotion however, athletes' emotional responses

have been often conceptualized within a global affect approach, based on hedonic tone (pleasant-unpleasant) distinctions (Watson & Tellegen, 1985). Previous studies have indicated that autonomous motivation positively predicts pleasant affect while less self-determined or controlled forms of motivation determine greater unpleasant affect (Gillet, Vallerand, Lafreniere, & Bureau, 2013; Pelletier et al., 1995; Vallerand & Blanchard, 2000).

Recognising that there are individual differences in the experience and interpretation of emotions, Hanin (2000) developed an individualized approach, which considers task- and person-relevant emotion content. According to Hanin's individual zones of optimal functioning (IZOF) model, emotions are at the core of an athlete's psychobiosocial state that includes a wide range of emotional (i.e., affective) and non-emotional states (i.e., cognitive, motivational, volitional, bodily-somatic, motor-behavioural, operational, and communicative). Emotional states are conceptualized in relation to two interrelated factors, hedonic tone (pleasure-displeasure), and performance functionality (functional-dysfunctional effects), resulting in four emotion categories: pleasant-functional emotions, unpleasant-functional emotions, pleasant-dysfunctional emotions, and unpleasant-dysfunctional emotions. Extensive empirical evidence has provided support for this conceptualization (see for reviews, Hanin, 2000, 2007; Ruiz, Raglin, & Hanin, 2016b).

The interrelations between perceptions of the motivational climate and pleasant/unpleasant emotional states were first examined by Bortoli, Bertollo, and Robazza (2009), and Bortoli, Bertollo, Comani, and Robazza (2011). In their studies with 13-14 youngsters, they found a positive link between perceptions of a task-involving climate and pleasant states, while an ego-involving climate positively related to unpleasant states. Perceptions of an ego-involving climate positively predicted unpleasant emotional states and antisocial behaviour in a study with young male soccer

players (Bortoli et al., 2012). In later research conducted in the physical education setting, Bortoli et al. (2014) found young students' pleasant and unpleasant states to mediate the relationship between motivational climate and individual's motivation, conceptualized as intrinsic motivation, identified regulation, external regulation and amotivation. In a recent intervention study involving female students (Bortoli, Bertollo, Vitali, Filho, & Robazza, 2015), findings revealed higher scores for experienced pleasant states in task-involving climates while higher scores for unpleasant states were reported in ego-involving climates. In line with the prevailing approach to studying emotions in the research at that time, the earlier Bortoli et al. studies (2009, 2011, 2012, 2014) only examined the intensity of pleasant and unpleasant states. Bortoli and colleagues (2015) implied that pleasant states were functional while unpleasant states were dysfunctional, but did not examine individuals' perceived functional impact of pleasant and unpleasant emotional states.

An individualized procedure for the assessment of athletes' performance-related emotional states has been recently proposed (Ruiz, Hanin, & Robazza, 2016a). The individualized profiling of psychobiosocial states uses both hedonic tone and functionality distinctions to assess athletes' feeling states related to performance. Similar to previous IZOF-based research (e.g., Hanin, 2000), athletes are given choices to identify the most task- and person-relevant descriptors of their experiences. Extending previous work on the assessment of athletes' experiences, the individualized profiling of psychobiosocial states assesses the functional and dysfunctional pleasant states, anxiety, and anger of the affective modality.

In the present study, we examined the relationships between social environmental (perceptions of the motivational climate), individual (motivation regulations) processes, and the hedonic tone and functionality of emotional states (as assessed via the individualized profiling of psychobiosocial states; Ruiz et al., 2016a) in

young adult national/international level athletes, Specifically, we investigated the relationship between athletes' perceptions of the task- and ego-involving features of the motivational climate, motivation regulations (i.e., autonomous motivation, controlled motivation, and amotivation), functional- and dysfunctional-pleasant (e.g., joy), and functional- and dysfunctional-unpleasant (e.g., anger and anxiety) emotional states. It was hypothesized that a perceived task-involving climate would positively relate to autonomous motivation, while a perceived ego-involving climate would positively predict controlled motivation and amotivation. Moreover, we expected that a task-involving climate would positively predict the intensity and reported helpful impact of pleasant emotional states, while an ego-involving climate would correspond to the intensity and reported harmful impact of anger and anxiety states. The mediation effects of motivation regulations in the relationship between motivational climate and intensity/functionality of performance-related emotional states were also examined.

The present research pulled from both AGT (Nicholls, 1989) and SDT (Deci & Ryan, 2000), with both frameworks assuming that emotions and indicators of optimal and dysfunctional engagement being a function of antecedent motivational processes. This perspective of considering emotions to be outcomes in their own right is also compatible with Hanin's (2000, 2007) IZOF model, which holds emotion intensity and impact to be proximal antecedents of performance. In the study by Bortoli et al. (2014), however, athletes' pleasant and unpleasant states were considered mediators of the relationship between motivational climate and the participants' motivation. Thus, a final aim of this investigation was to test a second hypothesized sequence, and examine the role of emotional states as mediators in the motivational climate and motivation regulations relationships.

Methods

Participants and Procedure

Participants were 494 Finnish athletes (283 men and 211 women; mean age = 20.28 ± 4.21 years), 365 competing in team sports (e.g., ice hockey, soccer, floorball, and basketball), and 129 in individual sports (e.g., swimming, karate, and track and field). Two hundred and three participants were international level athletes having achieved good results in European or World Championships, and 291 national level competitors. The study was conducted following approval from the local institution review board. The participants were recruited via training centres, sport schools and clubs in five cities in Northern, Central and Southern parts of Finland. Written consent was obtained from all participants after the purpose of the study was explained, voluntary participation emphasized, and assurances of the confidentiality of the results given. Athletes under 18 gave their assent and a guardian provided written consent. The questionnaires were administered either individually or in small groups, depending on the situation, in a quiet place, close to the participants training facilities. To ensure that participants had experience and awareness of the motivational aspects of the coach-created environment, data collection took place a few weeks after the beginning of the season thirty minutes prior to a practice session. Questionnaire administration took approximately 30 minutes.

Protocol and Measures

A multi-scale questionnaire package was used to assess the study variables. In the translation of the items, a standardized protocol (see Duda et al., 2013) was used. First, a bilingual person translated the scales from English into Finnish. Second, a panel of three academics whose first language was Finnish and were fluent in both written and spoken English, and familiar with the targeted scales, examined the translated versions. The panel members discussed possible discrepancies between items with efforts made

to ensure that the underlying meaning remained unchanged. Third, the modified Finnish versions were then back translated into English. Fourth, the translated English versions were compared to the original to ensure that the meaning and intent of the original items were maintained.

The multi-scale questionnaire included measures of the motivational climate motivation regulations and emotional experiences.

Motivational climate. The Perceived Motivational Climate in Sport Questionnaire-2 (PMCSQ-2; Newton et al., 2000) assesses athletes' perceptions of the motivational climate on their team in terms of its task and ego-involving climates. Task-involving climate items (e.g., "the focus is to improve each game/practice") reflect perceptions that the athlete has an important role on the team, and that co-operative learning and effort/improvement are encouraged. Ego-involving items (e.g., "players/athletes are afraid to make mistakes") reflect feelings of intra-team rivalry among players/athletes on the team, and perceptions that mistakes are punished and coach recognition is reserved for the most talented athletes. The stem question was "On this team..." and participants were asked to reflect on what the typical environment has been like over the past few weeks as created by their coach. Responses were indicated on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). In previous research, the PMCSQ-2 has demonstrated adequate internal reliability (i.e., Cronbach's $\alpha = .88$ for task-involving climate, and $\alpha = .87$ for ego-involving climate) and factorial validity (Newton et al., 2000).

Motivation regulations. Motivation regulations were assessed via the 24-item Behavior Regulation in Sport Questionnaire (BRSQ; Lonsdale, Hodge, & Rose, 2008). The BRSQ consists of six 4-item subscales tapping intrinsic motivation (e.g., "because I enjoy it"), integrated regulation (e.g., "because it's a part of who I am"), identified regulation (e.g., "because the benefits of sport are important to me"), introjected

regulation (e.g., "because I would feel ashamed if I quit"), external regulation (e.g., "because people push me to play") and amotivation (e.g., "but I question why I continue"). The stem of items was "I participate in my sport…" assessed on a 7-point Likert type scale ranging from 1 (*not at all true*) to 7 (*very true*). The BRSQ has been shown to have adequate internal reliability with values ranging from .79 (integrated regulation subscale) to .93 (external regulation) as reported by the authors (Lonsdale et al., 2008). Following Ryan and Connell's (1989) suggestion, composite scores were calculated for autonomous and controlled styles of motivation. Specifically, to form an indicator of autonomous motivation we averaged one item from each of the three subscales measuring intrinsic motivation, integrated regulation, and identified regulation. This resulted in a total of four composite indicators of autonomous motivation. Then, we followed the same procedure averaging one item from introjected regulation and one item from external regulation subscales, thereby obtaining a total of four indicators of controlled motivation. Scores in the amotivation subscale were averaged and kept separately.

Emotional experiences. Athletes' pleasant and unpleasant emotional experiences were assessed using the affective modality items of the individualized profiling of psychobiosocial states (Ruiz et al., 2016a), which consists of 20 rows of 74 items (3-4 per row) gauging performance-related states modalities. The affective modality is measured on six rows of items categorized as functionally helpful or harmful for performance. Specifically, three rows of items assess functional emotional states: (a) pleasant states ("enthusiastic, confident, carefree, joyful"); (b) unpleasant anxiety-related ("nervous, restless, discontented, dissatisfied"); and (c) unpleasant anger-related ("fighting spirit, fierce, aggressive"). Three rows of items measure dysfunctional emotional states: (a) pleasant states ("overjoyed, complacent, pleased, satisfied"); (b) unpleasant anxiety ("worried, apprehensive, concerned, troubled"); and

(c) unpleasant anger ("furious, resentful, irritated, annoyed"). Thirty minutes prior to a practice session, athletes were asked to select one word answering the question "how do you feel right now?" in relation to their forthcoming performance. Then they were asked to rate the intensity on a scale ranging from 0 (*nothing at all*) to 4 (*very much*). Athletes also rated the anticipated or perceived functional impact on performance on a scale ranging from +3 (*very helpful*) to -3 (*very harmful*).

Data Analysis

Data were screened for missing values, distribution, and potential outliers. Prior to conducting main analyses, factorial structure of the instruments was examined through confirmatory factor analyses (CFA). CFAs were performed with Mplus 7.31 (Muthén & Muthén, 2012) using the missing-data function and adjusting for non-normality with the robust full information maximum likelihood estimator (MLR estimator in Mplus). To determine the fit of the model, we considered different indices of fit that included chi-square (χ^2), the comparative fit index (CFI), the Tucker-Lewis Index (TLI), standardized root mean square residual (SRMR) and the root mean square error of approximation (RMSEA). A good model fit is inferred when values of CFI, and TLI are close to .95; the SRMR is smaller than .08; and the RMSEA is smaller than .06 (Hu & Bentler, 1999).

Structural equation modelling (SEM) analyses were conducted to test the hypothesized structural models of expected relationships between perceptions of the task and ego-involving features of the motivational climate (antecedents), motivation regulations and amotivation (mediators), as well as athletes' emotional states (consequences) in regard to their reported intensity, and functionality. Model fit was examined using MLR estimation and the same goodness of fit indices described above. SEM analyses were conducted using the complex method in Mplus, which corrects the standard error due to a possible team effect. Structural models with motivation

regulations positioned as outcome variables were also construed. Fit indices and Bayesian Information Criterion (BIC) and Akaike's Information Criterion (AIC) were examined to compare both sequences. The model with lower BIC and AIC values would be preferred.

Results

Descriptive Statistics

Descriptive statistics and alpha coefficients are presented in Table 1. As the table shows, the participants reported higher scores for task-involving climate, autonomous motivation, intensity of pleasant-functional states and functional anger. Lower scores were reported for amotivation, intensity of unpleasant (anxiety, and anger-related) states, with dysfunctional anxiety perceived as most harmful for performance. Cronbach's α coefficients of the Finnish version of the scales were deemed acceptable ranging from .78 to .90. Interestingly, athletes' ratings of the impact of their emotional states on performance reflected reverse perceptions for two items. Specifically, the content of the Pleasant states(-) item was perceived as helpful for performance (M = .94, SD = 1.34), whereas the Anxiety(+) item was viewed as harmful (M = -.56, SD = 1.43). Means of perceived impacts for the rest of items were in the expected directions.

[TABLE 1 NEAR HERE]

As shown in Table 2, task-involving and ego-involving climates were moderately and negatively correlated. Controlled motivation positively correlated with amotivation. Weak or no correlations were found between the affective modalities, thereby indicating that these modalities were relatively orthogonal or independent. As expected, perceptions of a task-involving climate negatively correlated with intensity scores of harmful anxiety and harmful anger as well as with the impact rating of harmful anger. Perceptions of a task-involving climate positively correlated with the impact scores of functional pleasant states and functional anger. Perceptions of an ego-

involving climate positively correlated with intensity scores of harmful anxiety and harmful anger.

[TABLE 2 NEAR HERE]

Psychometric Properties of the Scales

Confirmatory factor analyses (CFA) representing the two-factor model of the PMCSQ-2 fit the data poorly, χ^2 (494) = 1974.26, $P < .001$, CFI = .71, TLI = .69, RMSEA = .08, SRMR = .08. Model fit improved, χ^2 (457) = 873.48, $P < .001$, CFI = .92, TLI = .91, RMSEA = .04, SRMR = .06, after considering modification indices provided by Mplus in a step-by-step fashion. Modifications consisted of allowing residuals associated with some items to correlate. This was done for items in the same factor and with similar content. The standardized factor loadings varied between .20 and .82 and were all statistically significant ($P < .001$). Two items loaded poorly onto the expected factor. Specifically, item 12 "players are encouraged to outplay the other players" and item 24 "if you want to play in a game you must be one of the best players" had low loadings (< .30) into the ego-involving climate factor. For this reason and to improve the ratio of variable to sample size, construct-specific parcels were created (Little, Cunningham, Shahar, & Widaman, 2002). Individual items were combined into parcels based on the theoretical structure of the motivational climate as captured via the PMCSQ-2 (Newton et al., 2000). Specifically, three parcels were created for each higher-order factor by calculating the sums of the set of items representing second-order dimensions. Thus, three parcels were created from items representing cooperative learning, important role, and effort/improvement (task-involving climate factor), whereas the remaining items were assigned to three parcels representing punishment for mistakes, unequal recognition, and intra-team member rivalry (ego-involving climate). CFA indicated good fit to the data, χ^2 (8) = 8.32, $P < .001$, CFI = 1.00, TLI = 1.00, RMSEA = .01, SRMR = .01. Loadings varied between .82

and .89 (task-involving climate), and between .85 and .86 (ego-involving climate). A CFA for a two-factor model (autonomous and controlled motivations) of the BRSQ indicated a good fit to the data, χ^2 (19) = 71.67, $P < .001$ CFI = .97, TLI = .95, RMSEA = .08, SRMR = .05. Standardized factor loadings varied between .76 and .89 (autonomous motivation) and between .76 and .84 (controlled motivation). Amotivation was calculated as average scores. Adequate internal consistency for feeling states intensity (functional α = .74, dysfunctional α = .78) and perceived impact ratings (functional α = .78, dysfunctional α = .79) was found in recent research (Ruiz, Robazza, Tolvanen, & Hanin, 2016).

Structural Model

Structural equation modelling (SEM) analyses were conducted to examine direct relationships between motivational climate, motivation regulations (autonomous and controlled motivations), the intensity of athletes' feeling states, and their perceived functional impact ratings. We controlled for gender (male, female), sport type (individual, team sport), and competitive level (international, national) by entering them in the model as covariates. A model including autonomous motivation, controlled motivation and amotivation could not be estimated. Furthermore, the factor inter-correlation between controlled motivation and amotivation was high (r = .675, $P <$ .001), therefore, models were estimated including autonomous and controlled motivations only. First, a model including task- and ego-involving climates, autonomous and controlled motivations and intensity scores of athletes' emotional states (Model 1) revealed good fit to the data, χ^2 (161) = 286.583, $P < .001$, CFI = .969, TLI = .953, RMSEA = .040, SRMR = .029. A second model including the two climate variables, the two types of motivation, and the ratings of anticipated impact on performance (Model 2) also fitted the data well, χ^2 (161) = 280.360, $P < .001$, CFI = .970, TLI = .954, RMSEA = .039, SRMR = .029. Because intensity is closely related to

the functional impact of athletes' states on performance (Hanin, 2000), a third model was estimated including motivational climate, motivation regulations and emotion intensity as predictors of perceived functional impact of emotions. However, this model fitted the data poorly, χ^2 (308) = 825.320, $P < .001$, CFI = .886, TLI = .851, RMSEA = .058, SRMR = .073.

Significant path coefficients for Model 1 (emotion intensity) are presented in Figure 1. As expected, perceptions of task-involving climate were positive predictors of autonomous motivation. Task-involving climate was found to be a negative predictor of the intensity of anxiety and dysfunctional anger. Aligned with our hypotheses, autonomous motivation was a positive predictor of the intensity of pleasant states and functional anger.

Perceptions of an ego-involving climate predicted positively controlled motivation and the intensity of functional and dysfunctional anger. As expected, controlled motivation was a positive predictor of the intensity of anxiety and dysfunctional anger. The path from ego-involving climate to the intensity of dysfunctional anger was partially mediated by controlled motivation ($\beta = .05$, $P < .02$).

[FIGURE 1 NEAR HERE]

In addition, as Figure 2 depicts, perceptions of a task-involving climate were found to be positive predictors of impact ratings of functional anger (Model 2). As expected, autonomous motivation was a positive predictor of the impact ratings of pleasant states and functional anger. The path from task-involving climate to impact ratings of functional anger was partially mediated by autonomous motivation ($\beta = .06$, $P < .02$). Perceptions of an ego-involving climate predicted positively the impact ratings of functional anger. Controlled motivation was a negative predictor of impact ratings of dysfunctional pleasant states.

[FIGURE 2 NEAR HERE]

Aligned with Bortoli et al. (2014), structural models including the motivational climate, emotional states, and motivation regulations sequence were also tested for the intensity of the targeted emotion states. We also tested a model in regard to the prediction of the functional impact ratings. Models obtained for states intensity and impact ratings with motivation regulations as mediators revealed exactly the same fit indices, AIC and BIC values (AIC = 30153.557, BIC = 30691.706 for emotion intensity; AIC = 31654. 147, BIC = 32192.296 for emotion impact).

Discussion

The current study examined the interplay between motivational climate, motivation regulations, and emotional states in a sample of athletes involved in various sports at different competitive levels. Specifically, we examined perceptions of task-involving and ego-involving motivational climates as predictors of functional and dysfunctional (pleasant and unpleasant) feeling states. The hypothesised mediating role of motivation regulations was also tested. Overall, the study extended previous literature usually taking a global affect perspective (Watson & Tellegen, 1985) by using sport-specific, and individually relevant measures of functional and dysfunctional emotional states.

Athletes reported higher scores for perceptions of a task-involving climate, autonomous motivation, intensity of functional pleasant states impact ratings of functional anger and functional pleasant states, while dysfunctional anxiety and dysfunctional anger were rated as the most harmful for performance. Interestingly, the average of the impact ratings reported by the participants indicated that descriptors in the pleasant harmful category (i.e., "overjoyed, complacent, pleased, satisfied") were generally perceived as helpful, while descriptors in the helpful anxiety category (i.e., "nervous, restless, discontented, dissatisfied") were perceived as harmful. It is possible that some of our participants shared the common misconception that pleasant states are

typically beneficial for performance, while unpleasant states may be detrimental. Substantial empirical evidence though indicates that athletes may perceive pleasant states (e.g., satisfaction prior to performance) as harmful for performance and unpleasant states (e.g., anxiety and anger) as helpful for performance (Hanin, 2007; Ruiz et al., 2016b). Future studies, especially those utilizing a qualitative approach, could shed more light on the role of an athlete's level of awareness of the perceived impact of their emotional experiences.

In the present study, emotion state intensity and functionality were considered as outcomes, with motivation regulations as the hypothesised processes by which the task- and ego-involving feature of the motivational climate might impact emotion states. This proposed sequence is congruent with AGT (Nicholls, 1989) and SDT (Deci & Ryan, 2000) as both theories assume that variability in motivational processes influence emotional responses. The testing of a motivational climate, motivation regulations, and emotion sequence is also in line with the IZOF model (Hanin, 2000, 2007), which assumes that the prediction of performance is based on interactions of functional and dysfunctional pleasant and unpleasant emotions. Thus, according to the IZOF model, emotions are important outcomes in their own right.

Consistent with the literature, perceptions of a task-involving climate were moderately and negatively correlated with perceptions of an ego-involving climate (Duda & Balaguer, 2007). As expected and in agreement with AGT (Nicholls, 1989) and SDT (Ryan & Deci, 2000), a perceived task-involving climate was a positive predictor of autonomous motivation. Support for the hypothesized link between ego-involving climate and controlled motivation was also found. Our results are in line with previous studies that indicated that athletes who perceived their coaches to create a task-involving climate showed more adaptive motivational patterns, while the opposite was

found for an ego-involving climate (see for reviews, Duda & Balaguer, 2007; Ntoumanis & Biddle, 1999).

Most previous research (e.g., Abrahamsen et al., 2008) examining the interplay between motivational climate and emotion has only examined single emotions (i.e., anxiety) or considered the pleasant-unpleasant distinction (hedonic tone feature of emotions) in youth sport settings (Bortoli et al., 2012) or physical education (Bortoli et al., 2014). While pleasant and unpleasant distinctions are important, especially in regards to individuals' well-being, the functional impact on performance is usually the focus in high achievement sport settings. In this study, and consistent with the IZOF model (Hanin, 2000, 2007), hedonic tone and functionality distinctions were considered in the conceptualization and measurement of emotions. In addition to previous research (e.g., Bortoli et al., 2009, 2011, 2012, 2014), we assessed the intensity of athletes' emotional states and anticipated functional impact on performance. In line with previous research, our findings revealed that a task-involving climate was a statistically significant but weak negative predictor of the reported intensity of dysfunctional anxiety and dysfunctional anger (Figure 1). A perceived task-involving climate was a significant positive predictor of the impact ratings of functional anger (Figure 2). Significant and positive relationships were found between the most self-determined form of motivation or autonomous motivation and the intensity and impact ratings of pleasant states, and functional anger. Previous research has indicated that helpful effects of anger may be related to readiness to perform and the generation of energy in task execution (Ruiz & Hanin, 2004). Thus, it is not surprising that perceptions of an environment where effort, improvement or learning are emphasized would be related to a more helpful interpretation of anger.

Significant weak positive links were found for perceptions of an ego-involving climate and the intensity of anger. These results are in line with the tenets of AGT and

previous research indicating a positive relationship between a perceived ego-involving climate and unpleasant emotions (Bortoli et al., 2012; Ntoumanis & Biddle, 1999; Vazou et al., 2006). In line with our hypothesis, the less self-determined form of motivation, controlled motivation, was found to be a significant positive predictor of the intensity of anxiety and dysfunctional anger and a negative predictor of the impact of dysfunctional pleasant states. A perceived ego-involving climate emerged as a positive predictor of the impact ratings of anger. These results suggest that a competitive atmosphere, inherent to the sport context, can engender anger states individually perceived as functional for performance. Our findings concur well with the notion that anger may be interpreted as an "emergency resource" which may be helpful in the generation or mobilization of energy needed in sport specific situations (Ruiz & Hanin, 2011). Further longitudinal research examining this relationship may shed more light on the duration of the functional effects over time, or the potential consequences of such mobilized energy. As hypothesized, the path from ego-involving climate to the intensity of dysfunctional anger was partially mediated by controlled motivation.

Previous research has examined the role of pleasant and unpleasant emotions (Bortoli et al., 2014) or affect (Gillet et al., 2013) as mediators of the hypothesized motivational climate-motivation regulation relationships. Thus, in this investigation, we tested structural models representing this second sequence where emotions (both intensity and functionality in the present case) were positioned as mediators and motivation regulations as outcome variables. Standard fit indices, BIC, and AIC values were equal for models representing the alternative sequences. This finding indicated that models with motivation as mediators and models with emotions as mediators fitted data equally well. However, it is important to point out that the present findings stem from data assessed at one moment in time. Future research employing a longitudinal design may shed light into the mediating role of motivation regulations versus emotions in the

climate-outcome relationship and allow the examination of change over time in perceptions of the motivation climate, why athletes participate in their sport and their emotional states.

Conclusion

Findings in this study provide support for the notion that coaches' behaviours can influence athletes' motivation (Duda & Balaguer, 2007; Vallerand & Losier, 1999) and highlight the importance of creating a task-involving climate in achievement focused sport contexts. Our study contributes to the current literature by providing support to the use of sport-specific, and individually relevant measures of functional and dysfunctional emotional states. With the exception of the work of Bortoli and colleagues (2009, 2011, 2012, 2014), most previous research examining the relationship between motivational climate and emotions has mainly used non-sport specific instruments. In sport settings, however, it is important to assess person- and task-relevant emotion content (Hanin, 2000), thus the use of sports-specific measures is recommended. Furthermore, our study extends previous research by considering not just the intensity but also the functional impact of feeling states on performance. More research applying both intensity and functionality dimensions to the study of athletes' feeling states is encouraged.

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Table 1

Descriptive statistics and internal reliability of measures

	M	*SD*	Skewness	Kurtosis	Alpha
Task-involving climate (1-5)	3.98	0.50	-0.244	-0.227	.87
Ego-involving climate (1-5)	2.56	0.64	0.227	-0.230	.87
Autonomous motivation (1-7)	5.60	0.77	-0.398	-0.061	.87
Controlled motivation (1-7)	2.02	0.89	1.295	1.943	.90
Amotivation (1-7)	1.87	1.00	1.606	2.786	.78
Emotion intensity (0-4)					
Pleasant states(+)	2.60	0.78	-0.266	0.095	N/A
Anxiety(+)	1.40	1.06	0.422	-0.436	N/A
Anger(+)	1.78	1.10	0.121	-0.659	N/A
Pleasant states(-)	2.11	1.14	-0.263	-0.703	N/A
Anxiety(-)	0.99	1.04	0.878	0.039	N/A
Anger(-)	0.91	1.05	1.008	0.167	N/A
Emotion impact (-3 / +3)					
Pleasant states(+)	1.78	1.27	-1.316	0.708	N/A
Anxiety(+)	-0.56	1.43	0.156	-0.610	N/A
Anger(+)	2.09	1.22	-1.576	2.171	N/A
Pleasant states(-)	0.94	1.35	-0.739	0.456	N/A
Anxiety(-)	-1.42	1.18	0.657	0.499	N/A
Anger(-)	-0.98	1.40	0.378	-0.328	N/A

Note. N/A = items considered separately; (+) = functional; (-) = dysfunctional

Table 2

Bivariate correlations among the study variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1 Task-involving climate	-																
2 Ego-involving climate	-.35	-															
3 Autonomous motivat.	.35	-.12	-														
4 Controlled motivat.	-.14	.26	-.06	-													
5 Amotivation	-.20	.22	-.29	.79	-												
6 Pleasant states(+)^{intensity}	.06	-.09	.16	-.08	-.09	-											
7 Anxiety(+)^{intensity}	-.15	.13	-.03	.12	.09	-.10	-										
8 Anger(+)^{intensity}	.07	.11	.20	-.03	-.04	.21	.15	-									
9 Pleasant states(-)^{intensity}	.03	.01	.14	.00	-.02	.22	.04	.09	-								
10 Anxiety(-)^{intensity}	-.19	.20	-.07	.20	.24	-.19	.37	.07	-.02	-							
11 Anger(-)^{intensity}	-.24	.25	-.10	.23	.24	-.17	.34	.09	-.07	.45	-						
12 Pleasant states(+)^{impact}	.11	-.07	.18	-.10	-.13	.19	-.05	.25	.08	.00	-.12	-					
13 Anxiety(+)^{impact}	.07	-.09	.05	-.09	-.08	.11	-.06	.05	.03	-.17	-.20	.00	-				
14 Anger(+)^{impact}	.18	.00	.18	-.07	-.08	.11	-.05	.28	.07	-.02	-.06	.40	.01	-			
15 Pleasant states(-)^{impact}	.08	-.09	.15	-.14	-.15	.08	.02	.03	.49	-.02	-.12	.15	.00	.05	-		
16 Anxiety(-)^{impact}	.00	.00	-.08	-.01	.05	-.01	.03	.03	.05	.04	-.01	-.14	.23	-.22	.04	-	
17 Anger(-)^{impact}	-.13	.08	-.10	.03	.04	.01	-.05	-.03	.02	-.10	-.03	-.08	.28	-.05	-.04	.26	-

Note. Bivariate correlations of .09 and above are significant at $P < .05$; bivariate correlations of .12 and above are significant at $P < .01$; (+) = functional; (-) = dysfunctional

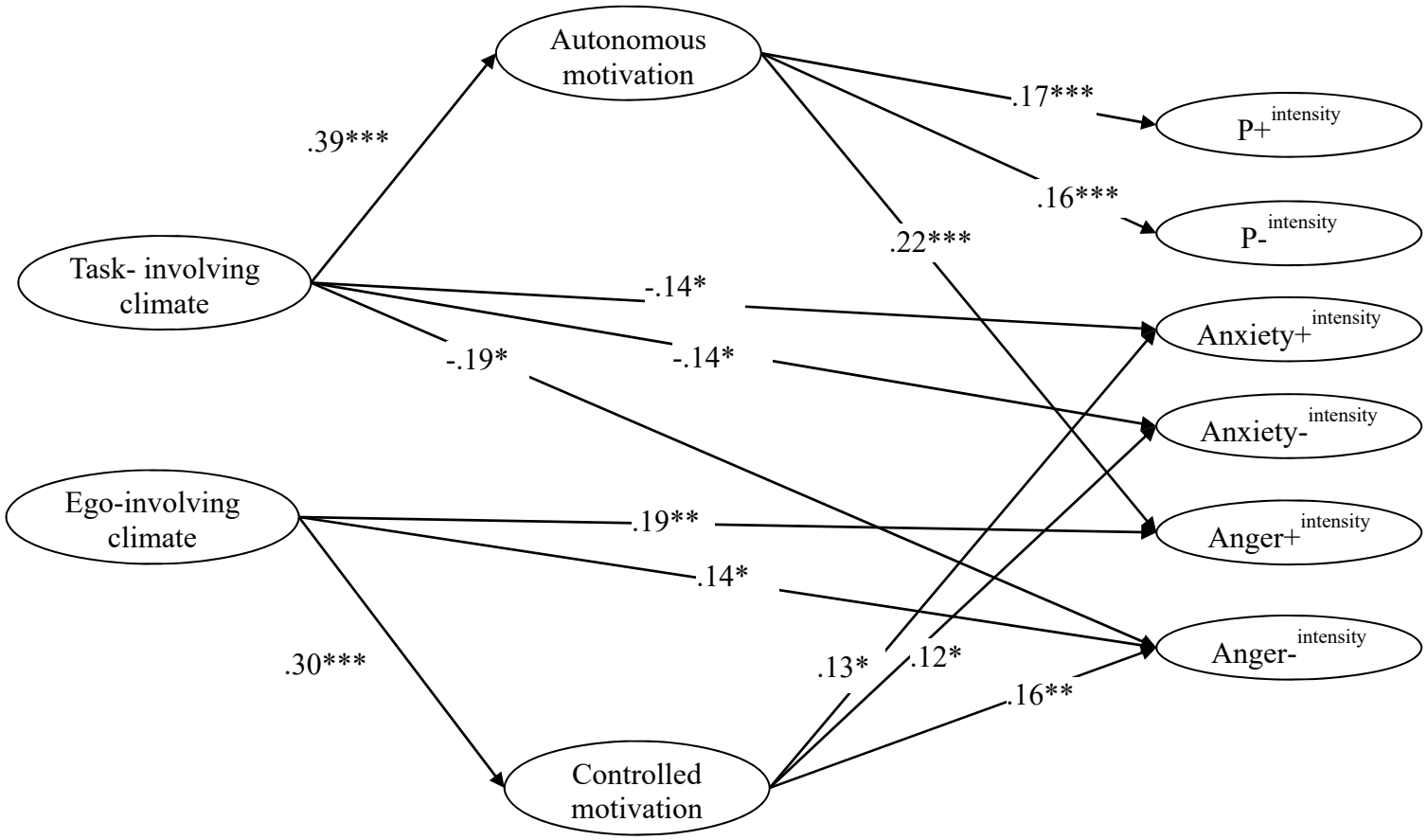

Figure 1
Structural equation model illustrating significant interrelationships between perceived task-, and ego-involving climates, autonomous motivation, controlled motivation, and the intensity of functional (+) and dysfunctional (-) feeling states. *Note*. All coefficients presented are standardized and significant (*$P < .05$, ** $P < .01$, *** $P < .001$).

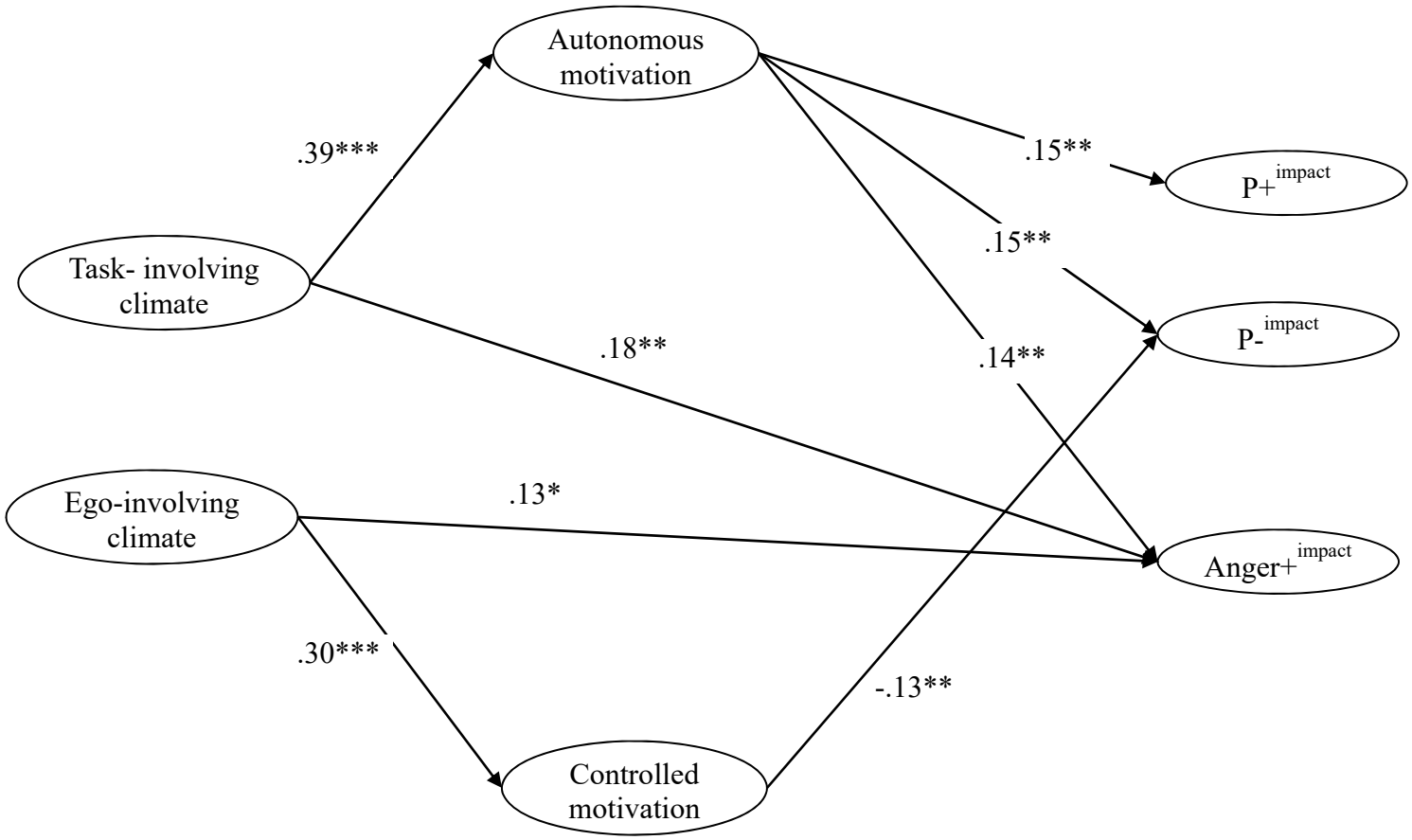

Figure 2
Structural equation model illustrating significant interrelationships between perceived motivational climate, autonomous motivation, controlled motivation, and impact ratings of functional (+) and dysfunctional (-) feeling states. *Note*. All coefficients presented are standardized and significant (*$P < .05$, ** $P < .01$, *** $P < .001$). There were no significant paths to impact ratings of functional anxiety, dysfunctional anxiety or dysfunctional anger. Thus, these variables are not presented in the model.