Author(s): Robazza, Claudio; Morano, Milena; Bortoli, Laura; Ruiz, Montse C.

Title: Perceived motivational climate influences athletes' emotion regulation strategies, emotions, and psychobiosocial experiences

Year: 2022

Version: Accepted version (Final draft)

Please cite the original version:

Robazza, C., Morano, M., Bortoli, L., & Ruiz, M. C. (2022). Perceived motivational climate influences athletes' emotion regulation strategies, emotions, and psychobiosocial experiences. Psychology of Sport and Exercise, 59, Article 102110. https://doi.org/10.1016/j.psychsport.2021.102110

Perceived Motivational Climate Influences Athletes' Emotion Regulation Strategies, Emotions, and Psychobiosocial Experiences

Claudio Robazza[1], Milena Morano[2,3], Laura Bortoli[1*], and Montse C. Ruiz[4]

[1]BIND-Behavioral Imaging and Neural Dynamics Center, Department of Medicine and Aging Sciences, "G. d'Annunzio" University of Chieti-Pescara, 66013 Chieti, Italy
[2]Parisi-De Sanctis Institute, MIUR (Italian Ministry of Education, University and Research), 71121 Foggia, Italy
[3]School of Medicine and Health Sciences, "G. d'Annunzio" University of Chieti-Pescara, 66013 Chieti, Italy
[4]Faculty of Sport and Health Sciences, University of Jyväskylä, 40014 Jyväskylä, Finland

*Correspondence: l.bortoli@unich.it

Declarations of interest: none.

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Abstract

The purpose of the study was to investigate whether athletes' perceptions about the motivational climate created by their coach influence emotion regulation strategies (i.e., cognitive reappraisal and expressive suppression), emotions, and psychobiosocial experiences of athletes. A sample of 459 competitive athletes (201 women, 258 men), aged 16 to 35 years, drawn from individual and team sports, completed self-assessment measures of perceived motivational climate, emotion regulation, sport emotions, and psychobiosocial experiences. Main results from structural equation modeling showed that perceived mastery climate was positively related to cognitive reappraisal, pleasant emotions, and psychobiosocial experiences, while perceived performance climate was positively related to expressive suppression and unpleasant emotions. Moreover, mediation analysis showed perceived mastery climate to have positive indirect effects on pleasant emotions and psychobiosocial experiences via cognitive reappraisal, while performance climate had indirect effects on unpleasant emotions via expressive suppression. Overall findings suggest that the type of motivational climate created by the coach has consequences in terms of athletes' emotion regulation strategies, emotions, and psychobiosocial experiences.

Keywords: achievement goal theory, process model of emotion regulation, cognitive reappraisal, expressive suppression

Perceived Motivational Climate Influences Athletes' Emotion Regulation Strategies, Emotions, and Psychobiosocial Experiences

The interplay between emotions and performance in sport has long been at the core of the interest of scholars and practitioners (Hanin, 2007; Lane et al., 2012; cf. Ruiz & Robazza, 2021). Emotions and related feelings are pervasive in achievement contexts and influence mental processes (e.g., perception, memory, decision making, effort), behavioral responses, and interpersonal relationships (Beatty & Janelle, 2020; Janelle et al., 2020). Consequently, being able to successfully regulate emotions of self and others is seen as an important psychological skill (Gould & Maynard, 2009; Wagstaff, 2014; for reviews, see Robazza & Ruiz, 2018; Ruiz & Robazza, 2020). Emotion regulation is regarded as a process by which an individual evokes thoughts or behaviors that modify the types of emotion experienced, as well as their intensity and duration (Peña-Sarrionandia et al., 2015; Richards & Gross, 2000). Emotion regulation broadly involves attempts to evoke, diminish (down-regulate), maintain, or intensify (up-regulate) the emotional experience and its expression (Gross, 1999; Gross & Thompson, 2007).

Gross's (1998) process model of emotion regulation assumes that emotions unfold over time and that specific regulation strategies have different consequences at different stages of the emotion-generation process. Based on this conceptualization, Gross and John (2003) developed the Emotion Regulation Questionnaire (ERQ) to assess people's use of two fundamental regulation strategies to alter emotion. The first strategy, cognitive reappraisal, is an antecedent-focused strategy in which persons attempt to modify the way they think about a situation to change its emotional impact (e.g., reappraising an upcoming competition as a challenge instead of a threat). Reappraisal occurs early in the emotion-generative process, before emotion response tendencies have been fully generated, and therefore allows the modification of the whole emotional sequence, including the experience of pleasure and displeasure, without relevant physiological, cognitive, or interpersonal costs. The second strategy, expressive suppression, is a response-focused strategy in which a person tries to inhibit the behavioral expression of their emotions. Expressive suppression

comes relatively late in the emotion-generative process and mainly modifies emotion response tendencies without reducing the experience of unpleasant emotions. It involves greater cognitive resources (i.e., attention and memory) and effort to monitor and regulate emotion-expressive behavior (Richards & Gross, 2000). The ERQ has been mainly used to assess university student populations (e.g., Gross & John, 2003) and general community samples (e.g., Preece et al., 2020), but it was also applied in sport (Cece et al., 2019; Robazza et al., 2021; Uphill et al., 2012).

Cognitive reappraisal was generally found to have more beneficial outcomes than expressive suppression, such as higher levels of positive affect (e.g., Balzarotti et al., 2010; Ioannidis & Siegling, 2015) and better interpersonal functioning (e.g., Cabello et al., 2013). In contrast, high expressive suppression scores have usually been associated with maladaptive outcomes (for a discussion, see Preece et al., 2020). Mixed results were reported in a study involving athletes: reappraisal scores were associated with pleasant emotions, while suppression scores were not associated with unpleasant emotions (Uphill et al., 2012). In a longitudinal study, Cece et al. (2019) found that adolescent athletes who reported higher scores of reappraisal were also more likely to display functional emotional trajectories, thus suggesting the ability to use reappraisal strategies could promote functional emotional trajectories across the season. In contrast, athletes who reported higher levels of suppression were more likely to display dysfunctional emotional trajectories. The findings suggest that expressive suppression is a maladaptive emotion regulation style.

Drawing on basic psychological needs theory, an important mini-theory of self-determination theory (Ryan & Deci 2017), Benita et al. (2020) investigated the effects of an adaptive emotion regulation style (i.e., integrative emotion regulation) and a maladaptive style (i.e., suppressive emotion regulation) on well-being in a sample of college students. The mediator of the relationship between emotion regulation styles and well-being was the satisfaction/frustration of the three basic psychological needs of autonomy, competence, and relatedness, which motivate achievement behavior and are fundamental for psychological growth, integrity, and well-being (Benita et al., 2020). Conceptually akin to cognitive reappraisal, integrative emotion regulation was found

positively linked to the satisfaction of the three basic psychological needs. On the other hand, suppressive emotion regulation was positively associated with the frustration of the basic psychological needs.

Self-determination theory shares premises and concepts with achievement goal theory (Nicholls, 1984), and both theories are widely applied to sport and exercise contexts (see Greenlees, 2022). Achievement goal theory predicts that the motivational climate coaches create can influence athletes' involvement, achievement motivation, and behavior. In a mastery (task-involving) climate the coach values and praises individual efforts, task commitment, and improvements, whereas in a performance (ego-involving) climate the coach values and praises winning and being better than others. Research findings have consistently shown that athletes who perceive themselves as being coached in a mastery atmosphere are more involved in the task and report higher level of enjoyment, positive mood, satisfaction, self-confidence (Duda & Appleton, 2016). They also display more positive peer relationships and sportspersonship, as well as lower levels of stress, anxiety, and burnout (for a review and meta-analysis, see Harwood et al., 2015). The impact of the motivational atmosphere created by coaches was also studied in relation to specific emotions. For example, an empowering climate, typified by task-involvement, autonomy-support, and social support, was found to correlate positively to happiness and negatively to anger (Ruiz et al., 2021a) assessed through the Sport Emotion Questionnaire (SEQ; Jones et al., 2005).

Collectively, study findings on emotion regulation strategies, motivational climate, and emotions, emanating from the process model of emotion regulation (Gross, 1998), achievement goal theory (Nicholls, 1984), and discrete emotion theories (e.g., Lazarus, 2006), suggest that mastery climate and cognitive reappraisal can lead to a range of adaptive outcomes, including pleasant and functional emotions. Conversely, performance climate and expressive suppression can lead to a variety of maladaptive outcomes, comprising unpleasant and dysfunctional emotions. In light of the above-mentioned theoretical frameworks, the relationship between perceived motivational climate, emotion regulation strategies, and emotions in sport has not been properly

examined so far. Therefore, a main objective of the present study was to investigate this relationship and, in particular, the indirect effects of motivational climate on discrete emotions through emotion regulation strategies.

Another central aim of the current study was to extend the investigation to the linkage between perceived motivational climate, emotion regulation strategies, and discrete emotion-related experiences athletes have as a result of their involvement in their sport context. Once again, we were particularly interested in assessing the indirect effects of motivational climate on discrete emotion-related experiences through emotion regulation strategies. To address this purpose, the conceptual framework adopted was the individual zones of optimal functioning (IZOF) model (Hanin, 2007) in addition to the process model of emotion regulation (Gross, 1998) and achievement goal theory (Nicholls, 1984). The IZOF model has stimulated a great deal of research in sport and related contexts (see Ruiz et al., 2017b). Previous studies in sport and physical education have consistently demonstrated that perceptions of a mastery climate are positively associated with a range of adaptive emotion-related (i.e., psychobiosocial) experiences (e.g., Bortoli et al., 2009, 2014, 2018; Di Battista, 2019; Ruiz et al., 2017a). Individual psychobiosocial experiences (or states) are described within three dimensions comprising at least twelve modalities: (a) psychological dimension—unpleasant/pleasant emotion, confidence, anxiety, motivation, volition, assertiveness, and cognitive modalities; (b) biological dimension—bodily-somatic and motor-behavioral modalities; and (c) social dimension—operational, communicative, and social support modalities (see Robazza et al., 2021; Ruiz et al., 2021b). Psychobiosocial experiences are therefore construed as a variety of emotional and non-emotional manifestations of total human functioning related to past, present, and future (anticipated) performances. Personal goals, beliefs about oneself and the world, evaluation of the availability of personal resources, and environmental demands come into play in the appraisal process that arouses and sustains emotional experiences (Lazarus, 1991). These experiences are situational (state-like), multimodal, and dynamic manifestations of ongoing relationships of an individual with the environment, or relatively stable

(trait-like) manifestations, which can be functional or dysfunctional, depending on the individual appraisal and their effect on performance process and outcome (Hanin & Ekkekakis, 2014). Psychobiosocial experiences are deemed to represent well the wide range of emotion-related feelings that can be evoked within the sport contexts.

Study purposes

The first purpose of this study was to investigate the relationships between perceived motivational climate, emotion regulation strategies, and emotions in sport. We expected: (a) perceived mastery climate to be positively related to cognitive reappraisal and pleasant emotions; and (b) perceived performance climate to be positively related to expressive suppression and unpleasant emotions (Hypothesis 1). We also expected to find significant indirect effects in the relationship between motivational climate and emotions via emotion regulation strategies. Specifically, we predicted positive indirect effects from perceived mastery climate to pleasant emotions via cognitive reappraisal, and from performance climate to unpleasant emotions via expressive suppression (Hypothesis 2).

The second objective was to investigate the links between perceived motivational climate, emotion regulation strategies, and psychobiosocial experiences. As previously stated, discrete psychobiosocial experiences have been found to appropriately reflect the wide range of emotion-related experiences elicited in sport settings (for reviews, see Robazza & Ruiz, 2020; Ruiz et al., 2017b). In the current study we assessed psychobiosocial experiences by means of the Psychobiosocial Experience Semantic Differential scale in sport (PESD-Sport; Robazza et al., 2021), which consists of 10 modalities represented by 30 bipolar items rated on a scale ranging from −4 (dysfunctional experience) to 4 (functional experience). Administered in a trait-like version (i.e., “how you usually feel…”) to two samples of athletes, the scale yielded positive scores on all modalities (Robazza et al., 2021), thereby denoting functional experiences. We therefore predicted: (a) mastery climate to be positively related to cognitive reappraisal and psychobiosocial experiences; and (b) performance climate to be positively associated with expressive suppression

and negatively linked to psychobiosocial experiences (Hypothesis 3). We also expected to find positive indirect effects from mastery climate to psychobiosocial experiences via cognitive reappraisal, and negative indirect effects from performance climate to psychobiosocial experiences via expressive suppression (Hypothesis 4).

Method

Participants

We involved in the study a convenience sample of 467 competitive athletes drawn from main sport clubs in central Italy. After removal of 8 cases identified as outliers, the final sample (N = 459) consisted of 201 women (71 from individual sports and 130 from team sports) and 258 men (87 from individual sports and 171 from team sports), aged 16 to 35 years (M = 21.13, SD = 6.29). The athletes had between 1 to 20 years of competitive experience (M = 9.00, SD = 5.55) at regional level (73%), national level (17%), and international level (10%) in a range of individual sports (n = 158; archery, fencing, gymnastics, martial arts, rhythmic gymnastics, swimming, tennis, track & field, and wrestling) and team sports (n = 301; baseball, basketball, futsal, rugby, soccer, volleyball, and water polo), and trained on average 3.83 times a week (SD = 1.67). Significant differences were not observed for age and sport experience between men and women or individual and team sports (p > .05).

Measures

The Perceived Motivational Climate in Sport Questionnaire (PMCSQ-2). Derived from Newton et al. (2000), the Italian version of the PMCSQ-2 (Bortoli & Robazza, 2004) consists of 12 items to assess individual perception of mastery climate (6 items; e.g., “On this team, the coach makes sure participants improve on skills they’re not good at”) and performance climate (6 items; e.g., “On this team, participants are encouraged to outplay the other participants”). Participants completed the questionnaire with reference to their current sporting experience. Items were rated on a 5-point scale from 1 (*strongly disagree*) to 5 (*strongly agree*). In an Italian sample, Cronbach α values were .76 on mastery scale scores and .70 on performance scale scores (Bortoli & Robazza,

2004). The PMCSQ-2 has been used in studies with Italian athletes (Vitali et al., 2015) also assessing functional and dysfunctional psychobiosocial states (Bortoli et al., 2011, 2012) and psychobiosocial experiences (Robazza et al., 2021).

The Emotion Regulation Questionnaire (ERQ). The ERQ (Gross & John, 2003) is a 10-item scale to assess the use of two regulatory strategies: cognitive reappraisal (6 items; e.g., "I control my emotions by changing the way I think about the situation I'm in") and expressive suppression (4 items; e.g., "When I am feeling negative emotions, I make sure not to express them"). Gross and John (2003) reported Cronbach α values between .75 and .82 (reappraisal items) and .68 and .76 (suppression items) across four different samples of undergraduate students. In an Italian sample of undergraduate students, α values were .84 for the reappraisal scale and .72 for the suppression scale (Balzarotti et al., 2010). To adapt the questionnaire to athletes, the original stem of item was modified from "how you control (that is, regulate and manage) your emotions" to "how you control (that is, regulate and manage) your emotions in your sporting context". Ratings were provided on a 4-point scale ranging from 1 (*not at all*) to 4 (*very much*). In a sample of British athletes, α coefficients were .82 for reappraisal and .70 for suppression (Uphill et al., 2012).

The Sport Emotion Questionnaire (SEQ). The SEQ (Jones et al., 2005) is a 22-item scale to measure the intensity of athletes' precompetitive excitement (4 items; e.g., "enthusiastic"), happiness (4 items; e.g., "joyful"), anxiety (5 items; e.g., "apprehensive"), dejection (5 items; e.g., "unhappy"), and anger (4 items; e.g., "annoyed"). Ratings are given on a 5-point scale from 0 (*not at all*) to 4 (*extremely*). Cronbach α values ranged from .81 to .88. In a study with Italian athletes, the factor structure (CFI = .930, TLI = .919, RMSEA = .047) and reliability (α range = .74−.86, composite reliability range = .74−.86) were supported (Robazza et al., 2016). In the current study, the question "how you feel right now, at this moment, in relation to the upcoming competition" (Jones et al., 2005) was modified to "how you usually feel before an important competition".

The Psychobiosocial Experience Semantic Differential scale in sport (PESD-Sport). The PESD-Sport (Robazza et al., 2021) consists of 30 bipolar items loading into 10 modalities (3 items

each) comprising: emotion u/p (unpleasant/pleasant), confidence, anxiety, assertiveness, and cognitive (psychological modality); bodily-somatic and motor-behavioral (bodily modality); and operational, communicative, and social support (social modality). Each item is formed by an adjective and its antonym (e.g., "unconfident–confident", "submissive–fighting spirit) as scale anchors in the semantic differential. Dysfunctional for performance adjectives are placed on the left of a Likert-type scale while functional for performance antonyms are placed on the right. Thinking about "how you usually feel before an important competition", ratings assigned on the bipolar Likert-type scale can range from 4 (*very much*) to 0 (*neither … nor*) on the "dysfunctional" side and from 0 to 4 on the "functional" side. Ratings attributed on the dysfunctional side are then transformed into negative scores. Therefore, the score of an item can range from −4 to 4, with 0 indicating no effect. In a sample of Italian athletes (Robazza et al., 2021), confirmatory factor analysis on the 10-modality model showed an acceptable fit to the data. Reliability was also good (α range = .75−.90, ω range = .74−.88, composite reliability range = .75−.90).

Procedure

The study was conducted in accordance with the declaration of Helsinki and after ethical approval by the ethics committee of the local university. We then contacted the sport managers and coaches, outlined the general objective of the study, and gained permission to approach the athletes. We involved in the study athletes who trained at least twice a week, competed consistently during the sporting season and were at least 16 years old. Before the assessment began, athletes were informed that participation was voluntary, they could withdraw from the study at any time without penalty, and their responses would be kept private. They were also provided information on the general objective of the study and instructions indicating that there were no right or wrong answers. In the case of participants under the age of 18, written informed consent was obtained from their parents. The athletes completed the questionnaires individually in a quiet room prior to a regular practice session, following the directions of an investigator who administered the scale in small groups of up to five people.

To address the potential issue of common method biases (i.e., the variance attributable to the measurement method instead of the constructs the measures represent) we took some procedural actions during assessment. These included guarantees of response anonymity, assurance that there were no right or wrong answers, emphasis on an honest responding, and emphasis on the importance of study results for applied purposes (Podsakoff et al., 2003). The relevance of the items with respect to the sport experience, the level of competence of the athletes, as well as the different format of the Likert-type scales and their labeling at every point rather than only at the end points were considered additional factors able to mitigate method biases (Podsakoff et al., 2012).

Data Analysis

Data were screened for missing values, potential univariate or multivariate outliers, and violations of assumptions of normality, linearity, multicollinearity, and homoscedasticity (Hair et al., 2019). To examine the factorial validity of the four measures (i.e., PMCSQ-2, ERQ, SEQ, and PESD-Sport), confirmatory factor analysis (CFA) was performed in Mplus 8.5 (Muthén & Muthén, 2017) using the maximum likelihood (MLR) parameter estimator with standard errors and a chi-square test statistic that are robust to non-normality. Descriptive statistics, Pearson product-moment correlation coefficients, Cronbach's α values, and McDonald's ω values were computed for all measures. Multivariate analysis of variance (MANOVA) was conducted on the mean scores of the dependent variables to evaluate possible differences by gender and sport categories (i.e., individual vs. team). Finally, two structural equation modeling (SEM) analyses were performed in Mplus to test the hypothesized relationships between perceived motivational climate, emotion regulation strategies, and competitive emotions (first analysis) or psychobiosocial experiences (second analysis). The bias-corrected bootstrap method based on 5000 resamples was used to test the expected mediation effects of emotion regulation strategies. With this method, a 95% confidence interval is computed around the standardized estimate (β). The indirect effect is assumed different from zero when zero is not in the interval (MacKinnon, 2008).

Results

Eight cases were removed from further analyses because they were identified as univariate or multivariate outliers (Mahalanobis' distance, $p < .001$). Skewness and kurtosis values of mean variable scores ranging from –1.761 to 2.123 and from –0.547 to 4.915, respectively, indicated deviation from normality. Therefore, the MLR method for CFA was considered appropriate. Regarding MANOVA, this analysis is deemed robust to departures from multivariate normality with large sample sizes (Kang & Jin, 2016). Descriptive statistics and correlation coefficients for the data are contained in Table 1.

Correlation coefficients (Table 1) indicated perceived mastery climate to be positively correlated with cognitive reappraisal, excitement and happiness, and most of the modalities of psychobiosocial experiences. Perceived performance climate was positively correlated with dejection and anger, and negatively related to emotion u/p and social support modalities. Moreover, cognitive reappraisal correlated positively with excitement and happiness, and most of the modalities of psychobiosocial experiences, while expressive suppression correlated positively with dejection and anger, and negatively with emotion u/p and social support modalities. All correlations were in the predicted direction, except for the correlation between expressive suppression and the communicative modality which was unexpectedly positive.

MANOVA yielded significant results by gender, Pillai's trace = .172, $F(19, 437) = 4.768$, $p < .001$, $\eta_p^2 = .172$, sport category, Pillai's trace = .121, $F(19, 437) = 3.179$, $p < .001$, $\eta_p^2 = .121$, and gender by sport interaction, Pillai's trace = .112, $F(19, 437) = 2.901$, $p < .001$, $\eta_p^2 = .112$. Follow-up comparisons showed men reporting higher mean rating scores on cognitive reappraisal, $F(1, 455) = 10.912$, $p = .001$, $\eta_p^2 = .023$, confidence, $F(1, 455) = 28.978$, $p < .001$, $\eta_p^2 = .060$, functional anxiety, $F(1, 455) = 11.268$, $p < .001$, $\eta_p^2 = .024$, and motor-behavioral, $F(1, 455) = 6.831$, $p = .009$, $\eta_p^2 = .015$, modalities, and lower scores in the anxiety scale of the SEQ, $F(1, 455) = 38.739$, $p < .001$, $\eta_p^2 = .078$. Compared to individual sport athletes, ratings of team sport athletes were higher in perceived performance climate, $F(1, 455) = 20.104$, $p < .001$, $\eta_p^2 = .042$, expressive suppression, $F(1, 455) = 9.194$, $p = .003$, $\eta_p^2 = .020$, and anger, $F(1, 455) = 12.839$, $p < .001$, $\eta_p^2 = .027$.

Gender by sport type interaction results showed differences on perceived performance climate, $F(1, 455) = 14.122$, $p < .001$, $\eta_p^2 = .030$, as well as on anxiety, $F(1, 455) = 13.233$, $p < .001$, $\eta_p^2 = .028$, dejection, $F(1, 455) = 12.556$, $p < .001$, $\eta_p^2 = .027$, and anger $F(1, 455) = 11.300$, $p < .001$, $\eta_p^2 = .024$, scales of the SEQ. Tukey's post hoc analysis indicated that male athletes involved in team sports reported higher scores on perceived performance climate, dejection, and anger, while female athletes involved in individual sports reported higher scores on the anxiety scale of the SEQ.

CFA on the PMCSQ-2 and ERQ data did not support the hypothesized two-factor structure of the measures because of poor loadings of some items in the expected factor. A reasonable fit to the data was reached after removal of two items of the mastery climate scale and two items of the perceived performance scale of the PMCSQ-2, and one item of the cognitive reappraisal of the ERQ (Table 2). Values for comparative fit (CFI) and Tucker Lewis fit (TLI) indices > .90, root mean square errors of approximation (RMSEA) and standardized root mean square residuals (SRMR) < .08 were deemed to reflect acceptable fit (Gunzler et al., 2021). Cronbach's α and McDonald's ω reliability values ranging from .65 to .88 were also acceptable. The two measurement models involving PMCSQ-2, ERQ, and SEQ, and PMCSQ-2, ERQ, and PESD-Sport yielded an acceptable fit to the data (Table 2).

A first SEM analysis was conducted to test the hypothesized relationships between perceived motivational climate, emotion regulation strategies, and precompetitive emotions. Gender, sport type, and gender by sport type interaction were entered as covariates in the model. As expected, direct positive effects were observed from perceived mastery climate to excitement and happiness, and from perceived performance climate to dejection and anger (Figure 1). Mastery climate and performance climate were also predictors of cognitive reappraisal and expressive suppression, respectively. Furthermore, cognitive reappraisal was positively linked to excitement and happiness, while expressive suppression was positively linked to dejection and anger. Mediation analysis showed (a) positive indirect effects from perceived mastery climate to excitement ($\beta = .102$, 95% CI

= .060, .161) and happiness (β = .089, 95% CI = .050, .142) via cognitive reappraisal, and (b) positive indirect effects from perceived performance climate to dejection (β = .041, 95% CI = .016, .085) and anger (β = .054, 95% CI = .022, .105) via expressive suppression.

The second SEM analysis was intended to scrutinize the relationships between perceived motivational climate, emotion regulation strategies, and psychobiosocial experiences. Gender, sport type, and gender by sport type interaction were entered as covariates in the analysis. As predicted, significant positive effects were found from perceived mastery climate and cognitive reappraisal to most of the psychobiosocial experiences (Figure 2). Positive effects were also observed from perceived performance climate to expressive suppression, while negative effects were shown from expressive suppression to emotion u/p and social support.

Mediation analysis showed positive indirect effects via cognitive reappraisal from perceived mastery climate to the following modalities: emotion u/p (β = .108, 95% CI = .064, .169), confidence (β = .099, 95% CI = .057, .153), anxiety (β = .092, 95% CI = .048, .155), assertiveness (β = .095, 95% CI = .055, .148), cognitive (β = .057, 95% CI = .027, .105), bodily-somatic (β = .074, 95% CI = .038, .124), motor-behavioral (β = .074, 95% CI = .036, .126), operational (β = .083, 95% CI = .045, .137), and social support (β = .058, 95% CI = .026, .106). Furthermore, negative indirect effects via expressive suppression emerged from perceived performance climate to emotion u/p (β = –.046, 95% CI = –.097, –.017) and social support (β = –.042, 95% CI = –.087, –.016), while a positive indirect effect was observed from performance climate to the communicative modality (β = .102, 95% CI = .042, .184).

Discussion

Drawing on achievement goal theory (Nicholls, 1984), the process model of emotion regulation (Gross, 1998), discrete emotion theories (e.g., Lazarus, 2006), and the IZOF model (Hanin, 2007), the purpose of the study was to investigate the relationships between athletes' perceptions of the motivational climate (i.e., mastery and performance) created by their coach, emotion regulation strategies (i.e., cognitive reappraisal and expressive suppression), and

emotions/psychobiosocial experiences. We also aimed to examine possible indirect effects of emotion regulation strategies in the relationship between motivational climate and emotions/psychobiosocial experiences.

Consistent with the research literature (John & Eng, 2014), the correlation between the ERQ reappraisal and suppression scales was close to zero (Table 1). This supports the notion that reappraisal and suppression are two independent regulatory strategies that athletes can use to varying degrees. As expected, perceived mastery climate was found positively related to cognitive reappraisal and pleasant emotions (i.e., excitement and happiness), while perceived performance climate was related to expressive suppression and unpleasant emotions (i.e., dejection and anger; Hypothesis 1). These results are consistent with research showing a perceived mastery atmosphere to be associated with higher levels of athletes' enjoyment, positive mood, and satisfaction, as well as lower levels of stress (Duda & Appleton, 2016; see Harwood et al., 2015). Notably, Ruiz et al. (2021a) also used the SEQ (Jones et al., 2005) to assess emotions in a sample of British athletes. They reported direct and indirect effects from empowering climate, which includes the features of a mastery climate, to happiness and excitement via autonomous motivation, and from disempowering climate, which includes performance climate, to dejection and anger via controlled motivation.

Our results also concur with extensive research conducted mostly in general population from predominantly Western cultural backgrounds (e.g., Gross & John, 2003; Preece et al., 2020), but also with athletic samples (Cece et al., 2019), suggesting that the antecedent-focused strategy of cognitive reappraisal is usually associated with positive affect (e.g., Balzarotti et al., 2010; Ioannidis & Siegling, 2015), whereas the response-focused strategy of expressive suppression tends to be related to stress (Spaapen et al., 2014). Interestingly, we observed cognitive reappraisal and expressive suppression to be positively linked with mastery climate and performance climate, respectively. Furthermore, mastery climate had positive indirect effects on pleasant emotions via cognitive reappraisal, while performance climate had positive indirect effects on unpleasant emotions via expressive suppression (Hypothesis 2).

Of the emotions assessed by means of the SEQ, anxiety did not correlate significantly with motivational climate and emotion regulation variables. These results are in line with those of Ruiz et al. (2021a) who did not find significant paths from disempowering climate to anxiety. This might be explained by differences in athletes' perception of the effect of anxiety on performance. Ample empirical evidence shows that athletes can appraise anxiety not only as debilitative, but also as facilitative, depending on their perception of the impact of anxiety symptoms on performance (Jones et al., 1994; Neil et al., 2012). Indeed, athletes may perceive increased heart rate, muscular tension, and other anxiety symptoms as beneficial for their competitive performance and helpful in energizing behavior and focusing attention to the task, notwithstanding the unpleasant appraisal of the anxiety symptoms. Therefore, athletes who appraise anxiety as useful may not be influenced by a particular motivational climate or feel the need to reappraise or suppress their symptoms.

In addition to emotions assessed through the SEQ, we also found support to the anticipated links between perceived motivational climate, emotion regulation strategies, and psychobiosocial experiences. Mastery climate and cognitive reappraisal correlated positively with most of the psychobiosocial experiences, while performance climate correlated positively with expressive suppression and negatively with two psychobiosocial modalities (i.e., emotion u/p and social support; Hypothesis 3). Contrary to what expected, expressive suppression correlated positively with the communicative modality. This result suggests that inhibiting the outward expression of feelings, especially unpleasant ones, may to some extent facilitate an athlete's communication with significant others (e.g., coaches and peers).

SEM analysis indicated that mastery climate had positive indirect effects on most of the psychobiosocial experiences via cognitive reappraisal, while performance climate had negative indirect effects on emotion u/p and social support modalities via expressive suppression (Hypothesis 4). These findings align with those including the emotions reported above and extend our knowledge to a range of emotion-related feelings that are functional to sport performance. The significant positive paths linking mastery climate and cognitive reappraisal to most psychobiosocial

modalities, and the only three paths linking performance climate and expressive suppression to emotion u/p, communicative, and social support modalities are likely due to the prevalence in the sporting context of a mastery climate over a performance climate accompanied by pleasant emotions and functional experiences. This contention is supported by the higher mean scores of mastery climate compared to performance climate, as well as high mean scores of excitement and happiness, low scores of dejection and anger, and positive scores on all psychobiosocial modalities observed across gender and sport categories (Table 1).

Looking more closely at the possible differences by gender and sport, relevant trends arose in the variables examined. Specifically, the higher mean rating scores on cognitive reappraisal observed in men were accompanied by higher confidence and functional anxiety, and lower scores in anxiety as measured on the SEQ. The higher reappraisal found in male athletes of our study sample contrasts with observations from general life contexts in which no gender differences in reappraisal use have been reported across cultures (cf. John & Eng, 2014). Higher cognitive reappraisal linked to higher confidence and lower dysfunctional anxiety in men may depend on the socially construed gender differences and stereotypes incorporated in the sport system. These social influences can shape the display of emotions and related feelings and, as a consequence, emotion regulation strategies (Morano et al., 2020; for a review, see Gill, 2020). Moreover, higher expressive suppression was linked to performance climate and anger for athletes involved in team sports compared to individual sports. Suppression comes late in the emotion-generative process, requires the athlete to effortfully control behavioral emotion response tendencies, and therefore consumes cognitive resources that could otherwise be used for task achievement and optimal performance. Thus, team sport coaches need to be particularly cognizant that a performance climate could engender maladaptive emotion regulation and dysfunctional anger in their athletes.

Conclusion

This is the first study to explore the relationships between motivational climate, emotion regulation strategies, and emotions/psychobiosocial experiences as conceptualized within

achievement goal theory (Nicholls, 1984), the process model of emotion regulation (Gross, 1998), discrete emotion theories (e.g., Lazarus, 2006), and the IZOF model (Hanin, 2007). Overall findings suggest that athletes' perceptions of the type of motivational climate created by the coach can have either positive or negative consequences in terms of adaptive or maladaptive emotion regulation strategies. These, in turn, are expected to lead to either pleasant or unpleasant emotions, and improved or worsened functional psychobiosocial experiences.

The results have practical implications for coaches and sport practitioners, suggesting that creating a mastery atmosphere in which athletes feel valued for personal efforts, engagement, and improvement can foster an adaptive emotion regulation style that enables the athletes to adapt effectively to the sport demands and get more pleasure and satisfaction from sport practice. In contrast, a performance climate in which winning and being better than others are valued can lead to maladaptive regulation, unpleasant emotions, and reduced sense of social support.

Despite the theoretical and practical implications of the results, the cross-sectional nature of this study precludes inferences of causal relationships. Indeed, cross-sectional research designs can only provide information on existing 'associations' or 'relationships' between the variables under investigation. Longitudinal or (quasi-) experimental research designs that assess the impact of one variable on other variables over time or as a consequence of a treatment can provide a test of causality and, thus, identify possible causal relations between variables (see Dormann & Guthier, 2019). Longitudinal or interventions studies are, therefore, needed to address this limitation and to confirm the hypothesis that motivational climates can influence emotion self-regulation and emotion-related states via regulation strategies.

References

Balzarotti, S., John, O. P., & Gross, J. J. (2010). An Italian adaptation of the Emotion Regulation Questionnaire. *European Journal of Psychological Assessment*, *26*, 61–67. https://doi.org/10.1027/1015-5759/a000009

Beatty, G. F., & Janelle, C. M. (2020). Emotion regulation and motor performance: An integrated review and proposal of the Temporal Influence Model of Emotion Regulation (TIMER). *International Review of Sport and Exercise Psychology*, *13*(1), 266–296. https://doi.org/10.1080/1750984X.2019.1695140

Benita, M., Benish-Weisman, M., Matos, L., & Torres, C. (2020). Integrative and suppressive emotion regulation differentially predict well-being through basic need satisfaction and frustration: A test of three countries. *Motivation and Emotion*, *44*(1), 67–81. https://doi.org/10.1007/s11031-019-09781-x

Bortoli, L., Bertollo, M., Comani, S., & Robazza, C. (2011). Competence, achievement goals, motivational climate, and pleasant psychobiosocial states in youth sport. *Journal of Sports Sciences*, *29*(2), 171–180. https://doi.org/10.1080/02640414.2010.530675

Bortoli, L., Bertollo, M., Filho, E., & Robazza, C. (2014). Do psychobiosocial states mediate the relationship between perceived motivational climate and individual motivation in youngsters? *Journal of Sports Sciences*, *32*(6), 572–582. https://doi.org/10.1080/02640414.2013.843017

Bortoli, L., Bertollo, M., & Robazza, C. (2009). Dispositional goal orientations, motivational climate, and psychobiosocial states in youth sport. *Personality and Individual Differences*, *47*(1), 18–24. https://doi.org/10.1016/j.paid.2009.01.042

Bortoli, L., Messina, G., Zorba, M., & Robazza, C. (2012). Contextual and individual influences on antisocial behaviour and psychobiosocial states of youth soccer players. *Psychology of Sport and Exercise*, *13*(4), 397–406. https://doi.org/10.1016/j.psychsport.2012.01.001

Bortoli, L., & Robazza, C. (2004). Il clima motivazionale nello sport. [Motivational climate in sport]. *Giornale Italiano di Psicologia dello Sport*, *1*, 9–16.

Bortoli, L., Vitali, F., Di Battista, R., Ruiz, M. C., & Robazza, C. (2018). Initial validation of the Psychobiosocial States in Physical Education (PBS-SPE) scale. *Frontiers in Psychology*, *9*(2446). https://doi.org/10.3389/fpsyg.2018.02446

Cabello, R., Salguero, J. M., Fernández-Berrocal, P., & Gross, J. J. (2013). A Spanish adaptation of the Emotion Regulation Questionnaire. *European Journal of Psychological Assessment*, *29*(4), 234–240. https://doi.org/10.1027/1015-5759/a000150

Cece, V., Lienhart, N., Nicaise, V., Guillet-Descas, E., & Martinent, G. (2019). Longitudinal sport motivation among young athletes in intensive training settings: Using methodological advances to explore temporal structure of Youth Behavioral Regulation in Sport Questionnaire Scores. *Journal of Sport and Exercise Psychology*, *41*(1), 24–35. https://doi.org/10.1123/jsep.2017-0194

Di Battista, R., Robazza, C., Ruiz, M. C., Bertollo, M., Vitali, F., & Bortoli, L. (2019). Student intention to engage in leisure-time physical activity: The interplay of task-involving climate, competence need satisfaction and psychobiosocial states in physical education. *European Physical Education Review*, *25*(3), 761–777. https://doi.org/10.1177/1356336X18770665

Dormann, C., & Guthier, C. (2019). Longitudinal data collection. In P. Brough, P (Ed.), *Advanced research methods for applied psychology: Design, analysis and reporting* (pp. 146–157). Routledge. https://doi.org/10.4324/9781315517971-15

Duda, J. L., & Appleton, P. R. (2016). Empowering and disempowering coaching climates: Conceptualization, measurement considerations, and intervention implications. In M. Raab, P. Wylleman, R. Seiler, A.-M. Elbe, & A. Hatzigeorgiadis (Eds.), *Sport and exercise psychology research: From theory to practice* (pp. 373–388). Elsevier Academic Press. https://doi.org/10.1016/B978-0-12-803634-1.00017-0

Gill, D. L. (2020). Gender and culture. In G. Tenenbaum & R. C. Eklund, R. C. (Eds.). *Handbook of sport psychology* (4th ed., pp. 1131–1151). Wiley. https://doi.org/10.1002/9781119568124

Gould, D., & Maynard, I. (2009). Psychological preparation for the Olympic Games. *Journal of Sports Sciences*, *27*(13), 1393–1408. https://doi.org/10.1080/02640410903081845

Greenlees, J. (2022). Creating an optimal motivational climate for effective coaching. In C. Heaney, N. Kentzer, & B. Oakley (Eds.). *Athletic development: A psychological perspective* (pp. 125–140). Routledge.

Gross, J. J. (1998). The emerging field of emotion regulation: An integrative review. *Review of General Psychology*, *2*(3), 271–299. https://doi.org/10.1037/1089-2680.2.3.271

Gross, J. J. (1999). Emotion regulation: Past, present, future. *Cognition and Emotion*, *13*(5), 551–573. https://doi.org/10.1080/026999399379186

Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology*, *85*(2), 348–362. https://doi.org/10.1037/0022-3514.85.2.348

Gross, J. J., & Thompson, R. A. (2007). Emotion regulation: Conceptual foundations. In J. J. Gross (Ed.), *Handbook of emotion regulation* (pp. 3–24). The Guilford Press.

Gunzler, D. D., Perzynski, A. T., & Carle, A. C. (2021). *Structural equation modeling for health and medicine*. Chapman and Hall/CRC. https://doi.org/10.1201/9780203701133

Hair, J. F. Jr., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate data analysis* (8th ed.). Cengage.

Hanin, J., & Ekkekakis, P. (2014). Emotions in sport and exercise settings. In A. G., Papaioannou & D. Hackfort (Eds.). *Routledge companion to sport and exercise psychology: Global perspectives and fundamental concepts* (pp. 83–104). Routledge.

Hanin, Y. L. (2007). Emotions in sport: Current issues and perspectives. In G. Tenenbaum & R. Eklund (Eds.), *Handbook of sport psychology* (3rd ed., pp. 31–58). Wiley.

Harwood, C. G., Keegan, R. J., Smith, J. M. J., & Raine, A. S. (2015). A systematic review of the intrapersonal correlates of motivational climate perceptions in sport and physical activity. *Psychology of Sport and Exercise*, *18*, 9–25. https://doi.org/10.1016/j.psychsport.2014.11.005

Ioannidis, C. A., & Siegling, A. B. (2015). Criterion and incremental validity of the emotion regulation questionnaire. *Frontiers in Psychology*, *6*, 247. https://doi.org/10.3389/fpsyg.2015.00247

Janelle, C.M., Fawver, B. J., & Beatty, G. F. (2020). Emotion and sport performance. In G. Tenenbaum & R. C. Eklund, R. C. (Eds.). *Handbook of sport psychology* (4th ed., pp. 254–298). Wiley. https://doi.org/10.1002/9781119568124

John, O. P., & Eng, J. (2014). Three approaches to individual differences in affect regulation: Conceptualizations, measures, and finding. In J. J. Gross (Ed.). *Handbook of emotion regulation* (2nd ed., pp. 321–345). The Guilford Press.

Jones, G., Hanton, S., & Swain, A. (1994). Intensity and interpretations of anxiety symptoms in elite and non-elite sports performers. *Personality and Individual Differences*, *17*(5), 657–663. https://doi.org/10.1016/0191-8869(94)90138-4

Jones, M. V., Lane, A. M., Bray, S. R., Uphill, M., & Catlin, J. (2005). Development and validation of the Sport Emotion Questionnaire. *Journal of Sport and Exercise Psychology*, *27*(4), 407–431. https://doi.org/10.1123/jsep.27.4.407

Kang, M. & Jin, Y. (2016). Factorial ANOVA and MANOVA. In N. Ntoumanis & N. D. Myers (Eds.). *An introduction to intermediate and advanced statistical analyses for sport and exercise scientists* (pp. 1–18). John Wiley & Sons.

Lane, A. M., Beedie, C. J., Jones, M. V., Uphill, M., & Devonport, T. J. (2012). The BASES expert statement on emotion regulation in sport. *Journal of Sports Sciences*, *30*(11), 1189–1195. https://doi.org/10.1080/02640414.2012.693621

Lazarus, R. S. (1991). *Emotion and adaptation*. Oxford University Press.

Lazarus, R. S. (2006). Emotions and interpersonal relationships: Toward a person-centered conceptualization of emotions and coping. *Journal of Personality, 74*(1), 9–46. https://doi.org/10.1111/j.1467-6494.2005.00368.x

MacKinnon, D. P. (2008). *Introduction to statistical mediation analysis*. Taylor & Francis.

Morano, M., Robazza, C., Ruiz, M. C., Cataldi, S., Fischetti, F., & Bortoli, L. (2020). Gender-typed sport practice, physical self-perceptions, and performance-related emotions in adolescent girls. *Sustainability*, *12*(20), 8518. https://doi.org/10.3390/su12208518

Muthén, L. K., & Muthén, B. O. (2017). *Mplus user's guide* (8th ed.). Muthén & Muthén.

Neil, R., Wilson, K., Mellalieu, S. D., Hanton, S., & Taylor, J. (2012). Competitive anxiety intensity and interpretation: A two-study investigation into their relationship with performance. *International Journal of Sport and Exercise Psychology*, *10*(2), 96–111. https://doi.org/10.1080/1612197x.2012.645134

Newton, M., Duda, J. L., & Yin, Z. (2000). Examination of the psychometric properties of the Perceived Motivational Climate in Sport Questionnaire - 2 in a sample of female athletes. *Journal of Sports Sciences*, *18*(4), 275–290. https://doi.org/10.1080/026404100365018

Nicholls, J. G. (1984). Achievement motivation: Conceptions of ability, subjective experience, task choice, and performance. *Psychological Review, 91*(3), 328–346. https://doi.org/10.1037/0033-295X.91.3.328

Peña-Sarrionandia, A., Mikolajczak, M., & Gross, J. J. (2015). Integrating emotion regulation and emotional intelligence traditions: A meta-analysis. *Frontiers in Psychology*, *6*. https://doi.org/10.3389/fpsyg.2015.00160

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, *88*(5), 879–903. https://doi.org/10.1037/0021-9010.88.5.879

Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2012). Sources of method bias in social science research and recommendations on how to control it. *Annual Review of Psychology*, *63*, 539–569. https://doi.org/10.1146/annurev-psych-120710-100452

Preece, D. A., Becerra, R., Robinson, K., & Gross, J. J. (2020). The Emotion Regulation Questionnaire: Psychometric properties in general community samples. *Journal of Personality Assessment*, *102*(3), 348–356. https://doi.org/10.1080/00223891.2018.1564319

Richards, J. M., & Gross, J. J. (2000). Emotion regulation and memory: The cognitive costs of keeping one's cool. *Journal of Personality and Social Psychology*, *79*(3), 410–424. https://doi.org/10.1037/0022-3514.79.3.410

Robazza, C., Bertollo, M., Ruiz, M. C., & Bortoli, L. (2016). Measuring psychobiosocial states in sport: Initial validation of a trait measure. *PLoS One*, *11*(12), e0167448. https://doi.org/10.1371/journal.pone.0167448

Robazza, C., & Ruiz, M. C. (2018). *Emotional self-regulation in sport and performance*. Oxford Research Encyclopedia of Psychology. https://doi.org/10.1093/acrefore/9780190236557.013.154

Robazza, C., Ruiz, M. C., & Bortoli, L. (2021). Psychobiosocial experiences in sport: Development and initial validation of a semantic differential scale. *Psychology of Sport and Exercise*, *55*, 101963. https://doi.org/10.1016/j.psychsport.2021.101963

Ruiz, M. C., & Robazza, C. (2020). Emotion regulation. In D. Hackfort & R. J. Schinke (Eds.), *The Routledge international encyclopedia of sport and exercise psychology: Volume 2: Applied and practical measures* (pp. 263–280). Routledge. https://doi.org/10.4324/9781315187228

Ruiz, M. C., & Robazza, C. (Eds.). (2021). *Feelings in sport: Theory, research, and practical implications for performance and well-being*. Routledge. https://doi.org/10.4324/9781003052012

Ruiz, M. C., Appleton, P. R, Duda J. L., Bortoli, L., & Robazza, C. (2021a). Social environmental antecedents of athletes' emotions. *International Journal of Environmental Research and Public Health*, *18*(9), 4997. https://doi.org/10.3390/ijerph18094997

Ruiz, M. C., Bortoli, L., & Robazza, C. (2021b). The multi-states (MuSt) theory for emotion- and action-regulation in sports. In M. C. Ruiz & C. Robazza (Eds.), *Feelings in sport: Theory, research, and practical implications for performance and well-being* (pp. 3–17). Routledge. https://doi.org/10.4324/9781003052012-2

Ruiz, M. C., Haapanen, S., Tolvanen, A., Robazza, C., & Duda, J. L. (2017a). Predicting athletes' functional and dysfunctional emotions: The role of the motivational climate and motivation regulations. *Journal of Sports Sciences*, *35*(16), 1598–1606. https://doi.org/10.1080/02640414.2016.1225975

Ruiz, M. C., Raglin, J. S., & Hanin, Y. L. (2017b). The individual zones of optimal functioning (IZOF) model (1978-2014): Historical overview of its development and use. *International Journal of Sport and Exercise Psychology*, *15*(1), 41–63. https://doi.org/10.1080/1612197X.2015.1041545

Ryan, R. M., & Deci, E. L. (2017). *Self-determination theory: Basic psychological needs in motivation, development, and wellness*. The Guilford Press.

Uphill, M. A., Lane, A. M., & Jones, M. V. (2012). Emotion Regulation Questionnaire for use with athletes. *Psychology of Sport and Exercise, 13*, 761–770. https://doi.org/10.1016/j.psychsport.2012.05.001

Vitali, F., Bortoli, L., Bertinato, L., Robazza, C., & Schena, F. (2015). Motivational climate, resilience, and burnout in youth sport. *Sport Sciences for Health*, *11*(1), 103–108. https://doi.org/10.1007/s11332-014-0214-9

Wagstaff, C. R. D. (2014). Emotion regulation and sport performance. *Journal of Sport and Exercise Psychology*, *36*(4), 401–412. https://doi.org/10.1123/jsep.2013-0257

Zhu, W. (2012). Sadly, the earth is still round ($p < 0.05$). *Journal of Sport and Health Science*, *1*(1), 9-11. https://doi.org/10.1016/j.jshs.2012.02.002

Table 1

Descriptive Statistics for Women and Men Involved in Individual and Team Sports, and Pearson Product-moment Correlation Coefficients for the Whole Sample (N = 459)

	Women		Men																		
	Individual (n = 71)	Team (n = 130)	Individual (n = 87)	Team (n = 171)																	
Variable	*M*±*SD*	*M*±*SD*	*M*±*SD*	*M*±*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. Mastery climate	4.05±0.81	4.06±0.78	4.15±0.73	3.91±0.86	—																	
2. Performance climate	1.51±0.71	1.56±0.72	1.35±0.53	1.97±0.89	–.61†	—																
3. Cognitive reappraisal	2.47±0.74	2.55±0.62	2.79±0.64	2.63±0.53	.23*	–.10	—															
4. Expressive suppression	2.12±0.64	2.25±0.69	2.20±0.68	2.47±0.64	–.18	.19	–.02	—														
5. Anxiety	2.16±1.06	1.69±0.90	1.29±0.81	1.46±0.86	–.01	.06	–.10	.04	—													
6. Dejection	0.38±0.55	0.32±0.49	0.19±0.37	0.52±0.68	–.15	.29*	–.09	.21*	.27*	—												
7. Anger	0.51±0.77	0.53±0.68	0.40±0.59	0.92±0.85	–.13	.33*	.00	.24*	.29*	.58§	—											
8. Excitement	2.66±0.96	2.71±0.70	2.62±0.76	2.78±0.84	.22*	–.02	.32*	–.09	.07	–.24*	.09	—										
9. Happiness	2.68±1.00	2.78±0.82	2.73±0.84	2.79±0.97	.25*	–.08	.31*	–.10	–.15	–.26*	–.06	.70†	—									
10. Emotion u/p	2.46±1.24	2.66±1.16	2.82±1.24	2.60±1.38	–.33*	–.27*	.35*	–.21*	–.21*	–.39*	–.17	.47§	.56§	—								
11. Confidence	1.48±1.74	1.73±1.57	2.34±1.19	2.41±1.34	–.25*	–.10	.35*	–.09	–.37*	–.37*	–.06	.46§	.45§	.70†	—							
12. Anxiety	0.90±1.83	1.02±1.63	1.38±1.57	1.60±1.44	–.15	–.06	.27*	–.01	–.26*	–.19	.02	.31*	.28*	.48§	.63†	—						
13. Assertiveness	2.26±1.48	2.57±1.27	2.72±0.96	2.69±1.34	–.24*	–.11	.30*	–.09	–.14	–.27*	.01	.49§	.37*	.61†	.66†	.53§	—					
14. Cognitive	2.49±1.22	2.42±1.39	2.64±1.18	2.65±1.25	–.26*	–.13	.21*	.00	–.13	–.26*	–.05	.34*	.28*	.51§	.54§	.45§	.57§	—				
15. Bodily-somatic	2.02±1.65	2.28±1.26	2.63±1.07	2.34±1.59	–.21*	–.16	.24*	.02	–.13	–.20*	.03	.45§	.35*	.56§	.59§	.44§	.63†	.58§	—			
16. Motor-behavioral	2.20±1.31	2.14±1.36	2.63±1.01	2.38±1.37	–.22*	–.16	.24*	–.02	–.11	–.26*	–.07	.37*	.31*	.54§	.58§	.44§	.51§	.62†	.68†	—		

17. Operational	2.08±1.34	1.93±1.41	2.39±1.31	2.29±1.29	.29*	–.19	.30*	–.08	–.15	–.28*	–.03	.42§	.37*	.61†	.67†	.55§	.60†	.60†	.66†	.77†	—	
18. Communicative	0.44±1.65	0.05±1.74	0.52±1.64	0.72±1.68	.00	.01	–.06	.31*	–.09	.07	.14	–.01	.03	.04	.18	.29*	.12	.18	.19	.21*	.18	—
19. Social support	2.50±1.23	2.26±1.50	2.65±1.05	2.35±1.46	.38*	–.31*	.24*	–.20*	–.13	–.35*	–.15	.34*	.36*	.72†	.57§	.34*	.44§	.48§	.44§	.52§	.58§	.04

Note. Correlation *low, §moderate, †moderately high (Zhu, 2012).

Table 2

Confirmatory Factor Analysis Fit Indices and Reliability Values of the Measures

Measure	Factor (number of items)	χ^2/df	CFI	TLI	RMSEA (90% CI)	SRMR	α	ω
PMCSQ-2		3.302	.946	.921	.071 (.052–.091)	.043		
	Mastery climate (4)						.775	.778
	Performance climate (4)						.796	.809
ERQ		2.572	.931	.904	.059 (.041–.076)	.052		
	Cognitive reappraisal (5)						.742	.785
	Expressive suppression (4)						.645	.648
SEQ		2.172	.924	.912	.051 (.044–.057)	.059		
	Anxiety (5 items)						.857	.863
	Dejection (5 items)						.807	.807
	Anger (4 items)						.730	.731
	Excitement (4 items)						.773	.776
	Happiness (4 items)						.877	.878
PESD-Sport		1.828	.948	.937	.042 (.037–.048)	.041		
	Emotion u/p (3 items)						.833	.834
	Confidence (3 items)						.789	.806
	Anxiety (3 items)						.836	.837
	Assertiveness (3 items)						.797	.797
	Cognitive (3 items)						.819	.819
	Bodily-somatic (3 items)						.860	.861
	Motor-behavioral (3 items)						.839	.843
	Operational (3 items)						.859	.859
	Communicative (3 items)						.755	.760
	Social support (3 items)						.880	.884
[1]PMCSQ-2, ERQ, SEQ		1.760	.910	.899	.041 (.037–.045)	.051		
[1]PMCSQ-2, ERQ, PESD-Sport		1.580	.938	.929	.036 (.032–.039)	.042		

Note. PMCSQ-2= Physical Self-Perception Questionnaire, ERQ = Emotion Regulation Questionnaire, SEQ = Sport Emotion Questionnaire, PESD-Sport = Psychobiosocial Experience Semantic Differential scale in sport, χ^2/df = chi-square/degrees of freedom, CFI = comparative fit index, TLI = Tucker Lewis fit index, RMSEA = root mean square error of approximation, SRMR = standardized root mean square residual, α = Cronbach's alpha values, McDonald's ω = omega values. [1]Measurement model.

Figure captions

Figure 1. Structural equation modeling results depicting the relationships between perceived motivational climate (mastery and performance), emotion regulation strategies (cognitive reappraisal and expressive suppression), and emotions controlling for gender, sport type, and gender by sport type interaction (covariates not shown for the sake of clarity). Only significant standardized estimates are presented ($p < .05$) for clarity.

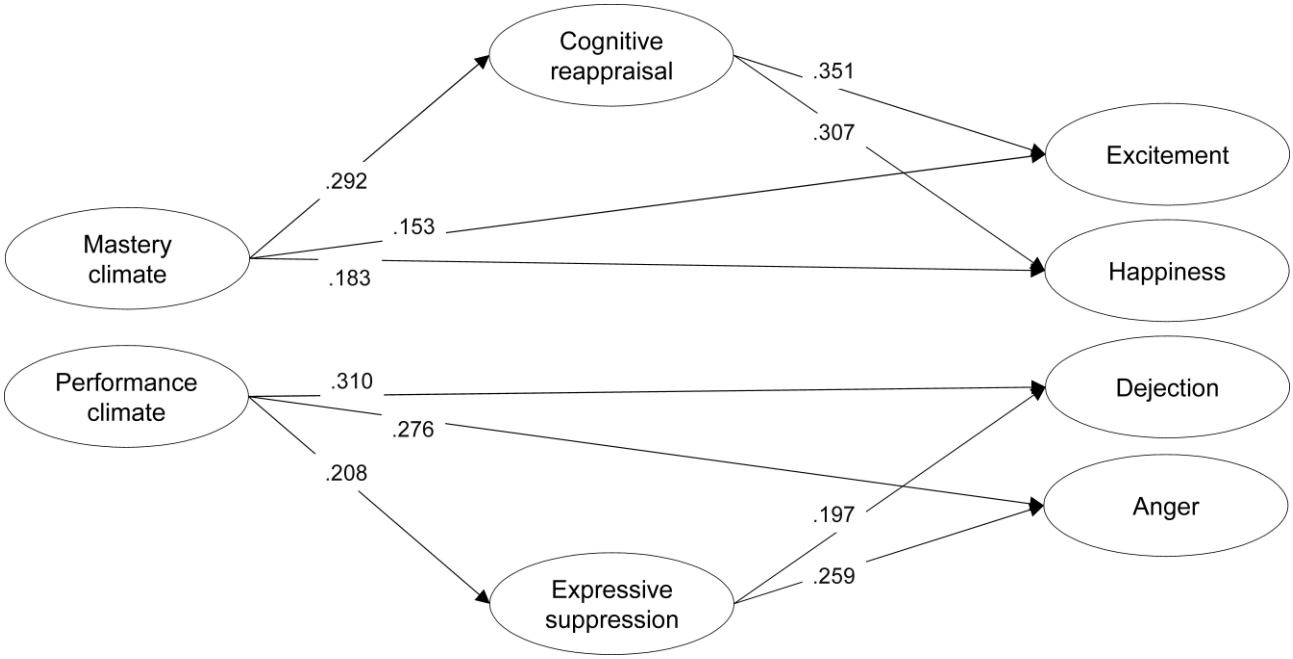

Figure 2. Structural equation modeling results depicting the relationships between perceived motivational climate (mastery and performance), emotion regulation strategies (cognitive reappraisal and expressive suppression), and modalities of psychobiosocial experiences controlling for gender, sport type, and gender by sport type interaction (covariates not shown for the sake of clarity). Only significant standardized estimates are presented ($p < .05$) for clarity.