Buch, R., Nerstad, C. G. L., Säfvenbom, R. (2015). The interactive roles of mastery climate and performance climate in predicting intrinsic motivation. *Scandinavian Journal of Medicine & Science in Sports*, 27, s. 245-253.

The Interactive Roles of Mastery Climate and Performance Climate in Predicting Intrinsic Motivation

Abstract

This study examined the interplay between perceived mastery and performance climates in predicting increased intrinsic motivation. The results of a two-wave longitudinal study comprising of 141 individuals from three military academies revealed a positive relationship between a perceived mastery climate and increased intrinsic motivation only for individuals who perceived a low performance climate. This finding suggests a positive relationship between a perceived mastery climate and increased intrinsic motivation only when combined with low perceptions of a performance climate. Hence, introducing a performance climate in addition to a mastery climate can be an undermining motivational strategy, since it attenuates the positive relationship between a mastery climate and increased intrinsic motivation. Implications for future research and practice are discussed.

Keywords: Intrinsic motivation, mastery climate, performance climate

According to achievement goal theory (AGT) (Nicholls, 1984, 1989), individuals feel successful when striving to advance their ability (mastery orientation) or when demonstrating their competence relative to others (performance orientation). Furthermore, AGT assumes that goal orientations are a function of the context, and in particular, the perceived motivational climate (Ames, 1992b). The latter refers to individuals' perceptions of the extant criteria of success or failure in the environment (cf., Nerstad, Roberts, & Richardsen, 2013b), and can be characterized as more or less performance and mastery involving. Prior research has shown that a performance climate which emphasizes interpersonal competition and social comparison (Ames, 1992b) typically relates to less self-determined motivation (Harwood, Keegan, Smith, & Raine, 2015; Parish & Treasure, 2003), poorer performance, and effort withdrawal (Nerstad, Roberts, & Richardsen, 2013a). In contrast, a mastery climate which emphasizes skill development, task mastery, and cooperation, typically relates to greater effort (Lau & Nie, 2008), performance (e.g., Nerstad, et al., 2013a), and intrinsic motivation (e.g., Brunel, 1999; Harwood, et al. 2015; Moreno, González-Cutre, Sicilia, & Spray, 2010).

One assumption of traditional AGT is that perceived mastery and performance climates are orthogonal (Ames, 1992b). An individual can thus perceive the motivational climate as being both more or less performance and mastery involving, or highly mastery involving and less performance involving, or vice versa. It is likely that mastery and performance climates are two independent dimensions of the perceived motivational climate that interact to affect motivation and behavior (Ames, 1992a, 1992b). Although we are not aware of studies that have directly investigated this possibility, Ommundsen and Roberts (1999) justified such a position by exploring different profiles of the motivational climate and achievement and socially related cognitions among sport athletes. Their results indicate that a high mastery climate moderates the impact of being in a high performance climate such that perceiving a performance climate may not be motivationally maladaptive when accompanied

by a mastery climate (Ommundsen & Roberts, 1999). This led Ommundsen and Roberts to conclude that "introducing mastery oriented criteria *in addition* to the extant performance oriented criteria seems to be a desirable motivational strategy to follow" (p. 396).

In the present paper, we argue that even though a performance climate may not negatively influence individual outcomes (e.g., intrinsic motivation) when accompanied by a high-mastery climate, a mastery climate may not work as well in positively influencing individual outcomes when accompanied by a high performance climate (cf. Ames, 1992a; Ames, 1992b). This is likely, as the two climate dimensions represent different value systems (Ames & Ames, 1984a). One is focused on values which enhance individual growth, learning and cooperation, while the other is focused on values enhancing egoistic motivation in which normative comparison information is important (Ames & Ames, 1984a; Roberts, 2012). If this is correct, recommendations to couple a mastery climate with a performance climate may not be helpful, but undermining. Ames (1992a), for instance, argues that social comparison-based evaluation practices implied by a high-performance climate may undermine autonomy, and thus self-determined motivation (i.e., intrinsic motivation). We therefore set out to contribute to AGT and self-determination theory (SDT) by investigating whether the relationship between a perceived mastery climate and intrinsic motivation depends on the level of perceived performance climate. By doing so, we aim to clarify the interactive (multiplicative) impact of situational criteria (i.e., mastery and performance climate) in predicting an adaptive individual outcome (i.e., intrinsic motivation).

Theory and Hypotheses

According to AGT (Ames, 1992a, 1992b; Nicholls, 1989), the motivational climate is defined as the extant criteria of success and failure accentuated through practices, policies, and procedures in the achievement context (cf., Nerstad, et al., 2013a). The implication here is

that such a climate represents an important factor serving to create, restrict, enhance, differentiate, and equalize motivational opportunities for individuals (Ames, 1984; Nicholls, 1989). Such a climate consists of a mastery climate and a performance climate which determine how individuals are evaluated, how they should relate to each other, what they are to accomplish, and how they should relate to the task at hand (Ames, 1984; Ames & Ames, 1984b). Achievement contexts characterized by learning opportunities, cooperation and mastery, or trying hard to do one's best are typically portrayed as mastery climates (Pensgaard & Roberts, 2002). In contrast, achievement contexts that emphasize end results, or "winning," and are characterized by social comparisons, public demonstration of ability, and interpersonal rivalry are typically portrayed as performance climates (Jaakkola, Ntoumanis, & Liukkonen, 2015; Pensgaard & Roberts, 2002).

While AGT provides important insights for our understanding of motivation, other theories may be construed as complementary to AGT. Among these – and of special interest for the present study – is self-determination theory, because in addition to facilitating an understanding of the *why* (i.e., process) of goal pursuit, it also considers the *what* (i.e., content) of goal pursuit (SDT; Deci & Ryan, 2000). According to SDT, individuals can be motivated for different reasons. Individuals who are more intrinsically motivated engage in activities because they derive feelings of pleasure and satisfaction directly from participation, whereas individuals who are more extrinsically motivated engage in an activity to obtain desirable outcomes or to avoid undesirable outcomes (e.g. Deci, Ryan, & Williams, 1996; Gagné & Deci, 2005). In other words, intrinsic motivation is non-instrumentally focused, while extrinsic motivation is dependent on and focused toward contingent outcomes which can be separated from the action itself (Ryan & Deci, 2002). Because individuals engage freely in a certain activity and because their motivation is sustained by experiences of interest and enjoyment, intrinsic motivation represents a prototype of self-determined activity (Ryan

& Deci, 2002). Thus, intrinsic motivation is argued to be based in people's needs to be self-determined, competent and related to others (Deci & Ryan, 1985). SDT further postulates that intrinsic motivation is facilitated by contextual conditions conducive to autonomy, or self-determination (cf., Deci & Ryan, 1985; Moreno, et al., 2010). Accordingly, there are two main cognitive processes through which contextual factors, such as a mastery climate, influence intrinsic motivation. The first process is represented by a change in perceived locus of causality (i.e., what initiates action) (Ryan & Deci, 2002). Thus, when the situation encourages a more internally perceived locus, intrinsic motivation will be enhanced (Deci & Ryan, 1985; Ryan & Deci, 2002). Because the characteristics of a mastery climate (i.e., emphasis on participation, improvement, self-determination, development, learning, and trying hard to do one's best) represents aspects prompting an internal perceived locus of causality and are important in facilitating need fulfillment, we expect that a mastery climate relates positively to intrinsic motivation (Brunel, 1999; Harwoord, et al. 2015). For instance, the inclusion of individuals in decision-making processes facilitates the satisfaction of the need for autonomy (Ommundsen, Lemyre, Abrahamsen, & Roberts, 2010; Roberts, 2012).

In the second cognitive process, referred to as change in perceived competence, SDT postulates that situations which foster perceived competence tend to enhance intrinsic motivation (Ryan & Deci, 2002). For example, it is likely that a mastery climate's self-referenced emphasis on task mastery and skill development facilitates the satisfaction of the need for competence (Ommundsen, et al. 2010). Because a mastery climate places great emphasis on mastery and task improvement, individuals are more likely to become motivated by the intrinsic aspects of a task (e.g., learn new skills or master/improve already-learned skills) (Standage, Duda, & Ntoumanis, 2003). In addition, when individuals are motivated to perform in terms of self-referenced criteria of success, the activity or task is more within the individuals' control, which is likely to facilitate the need for autonomy and make their

perceptions of adequate competence more resilient (e.g., Standage, et al., 2003). In support of such arguments, prior research has demonstrated a positive relationship between mastery climate and more intrinsic or self-determined motivation (e.g., Moreno, et al., 2010; Parish & Treasure, 2003). Accordingly, we hypothesize:

Hypothesis 1: There is a positive relationship between mastery climate and increased intrinsic motivation.

The Interactive Roles of Mastery and Performance Climates

Ames (1992a) postulates that different dimensions (i.e., mastery and performance) of the motivational climate are multiplicative. According to the study plan, the military academies included in this study have an initial focus on the growth and development of their cadets, through for example an emphasis on rewarding cadets' efforts and mastery of tasks/activities. However, as documented in prior research, the military sector, and thus military education, has been engaged in a long transformation process advocating a shift from a soldiering ethos based on obedience to authority and skill-execution based on following orders, towards an identity based on autonomous soldiers that are able to take initiative and act flexibly and independently (Sookermany, 2012). This indicates that the military academies are slowly moving towards study plans advocating a mastery climate. Yet, due to a rather strong military and masculine culture where outraging opponents often become more in focus compared to exploration of tasks (DeShon & Gillespie, 2005), the achievement context at the academies are likely to simultaneously reflect mastery- and performance climate cues. This opens up the possibility that the positive contributions of a mastery climate on intrinsic motivation may very well be undermined by a performance climate, a possibility also acknowledged by Ommundsen and Roberts (1999). In accordance, we argue that there is a

weaker positive relationship between mastery climate and intrinsic motivation for individuals who simultaneously perceive the motivational climate as more performance involving. Specifically, individuals who perceive a performance climate may typically believe that mistakes and poor performance will be punished, that intra-team/group competition is encouraged, and that only high-performing team-members will receive attention (e.g., Newton & Duda, 1999). Furthermore, a performance climate is likely to promote participation for some form of external reward or entity rather than for the sake of the activity itself (Vallerand, Gauvin, & Halliwell, 1986). Therefore, a performance climate is likely to be perceived as more controlling, which according to SDT is likely to reduce feelings of autonomy, or the need for "being the perceived origin or source of one's own behaviors" (Ryan & Deci, 2002, p. 8). The controlling aspects of a performance climate are those that represent a pressure toward specified results and which conduce individuals to a shift toward a more external perceived locus of causality (cf., Ryan & Deci, 2002). As a result, intrinsic motivation becomes undermined (Deci & Ryan, 1985).

Furthermore, while a mastery climate is likely to facilitate satisfaction of the need for competence, or "feeling effective in one's ongoing interactions with the social environment and experiencing opportunities to exercise and express one's capacities" (Ryan & Deci, 2002, p. 7), individuals in a perceived performance climate may perceive that their ability (and/or effort) is not high enough, particularly when they fail. Failure leaves them to deplore the situation and self-attribute incompetence (Ames, 1984; Nicholls, 1989), which may undermine the need for competence because their sense of self-worth becomes threatened (Ames, 1984). With its focus on cooperation, shared effort, and positive social interdependence among individuals, a mastery climate is likely to facilitate the satisfaction of the need for relatedness, or the need to be connected to others (Gagné & Deci, 2005). However, a performance climate is likely to promote negative interdependence among

individuals due to interpersonal competition and rivalry which may undermine the need for relatedness (cf., Černe, Nerstad, Dysvik, & Škerlavaj, 2014). In other words, the opportunity for one person to attain rewards or a goal is reduced when others are successful (Ames, 1984). Hence, although a mastery climate may positively influence intrinsic motivation through facilitating need satisfaction, higher levels of a performance climate are likely to undermine such efforts, reducing the positive relationship between a mastery climate and intrinsic motivation. This argument aligns well with the theorizing of SDT, suggesting that although informational aspects (i.e., mastery climate) of social contexts provide feedback supporting an individual's experience of competent engagement and intrinsic motivation, the simultaneous existence of controlling contextual aspects (i.e., performance climate) encourages a change in perceptions toward a more external locus of causality resulting in an undermining of intrinsic motivation (Deci & Ryan, 1985; Ryan & Deci, 2002). Therefore, we hypothesize:

Hypothesis 2: The relationship between mastery climate and increased intrinsic motivation is moderated by performance climate; the higher the performance climate, the less positive the relationship.

Method

Participants and Procedure

Data for this study were collected from Norwegian cadets in three military academies at two points in time (referred to here as T1 and T2). Military academies draw the attention from a resilient and healthy group of self-governing young people who, compared to regular university students are exposed to a relatively hierarchical, authoritative and competitive style of education. In addition to our ambition to pinpoint such contextual ambiguity, our choice of military academies as research units also secured the longitudinal design.T1 data were collected at the end of the cadets' first year at the academy, while T2 data were collected at

the end of the cadets' second year. Expect from normal progression in the planned outcome of the academies no major changes in content or curriculum, that could affect the analysis were identified between the first and the second year. One researcher from the research project attended all schools and administered the questionnaires, which were completed in plenary using paper and pencil at the three academies. In cases where a cadet was unable to meet for the plenary session, (s)he was given the opportunity to complete the questionnaire later on alone. For the two measurement occasions, cadets filled out a personal code which we used to match the questionnaires. The participants were informed that the survey had been approved by the Norwegian Social Science Data Services (NSD) and by the Regional Committee for Medical and Health Research Ethics and strict confidentiality was assured. At T1, 248 individuals (84 % response rate) volunteered to participate and gave their written consent after receiving information about the study. Of these, 123 individuals (50% response rate) also participated at T2. The sample included 89.5% men and 10.5% women with a mean age of 23.6 years (*SD* = 2.63).

Measures

Mastery and performance climate. To measure mastery climate and performance climate at T1, we employed the Norwegian version (Roberts & Ommundsen, 1996) of the Perception of Motivational Climate in Sport Questionnaire (PMCSQ). Preceding the items we used the following stem: "In the context of physical education at the academy, I feel that . . . ". Sample items include "Doing better than others is important" and "Cadets are punished for mistakes." Respondents recorded their responses on a 5-point scale (1 = strongly disagree to 5 = strongly agree). Prior studies using the Norwegian version of the PMCSQ have demonstrated satisfactory validity and reliability (e.g., Roberts & Ommundsen, 1996; Miller,

Roberts, and Ommundsen, 2004). In the present study, the estimated reliability of mastery and performance climate was $\alpha = .76$, and $\alpha = .79$, respectively.

Intrinsic motivation. We measured intrinsic motivation at T1 and T2 using the Situational Motivation Scale (SIMS; Guay, Vallerand, & Blanchard, 2000). We used the stem: "I currently engage in physical education lessons at the academy . . . " Sample items include "Because I feel good when doing this activity" and "Because I think that this activity is interesting." The respondents recorded their responses on a 7-point (1 = strongly disagree to 7 = strongly agree). Previous research have demonstrated the validity and reliability of the SIMS in several areas including the sport domain (e.g., Guay et al., 2000; Standage, Treasure, Duda, & Prusak, 2003). The estimated reliability in the present study was $\alpha = .91$.

Control variables. Because of their potential relationships with intrinsic motivation and the motivational climate, we controlled for mastery orientation and performance orientation at T1, using the Perception of Success Questionnaire (POSQ; Roberts, Treasure, & Balague, 1998), which have been shown in past research to demonstrate adequate reliability and validity (e.g., Roberts & Ommundsen, 1996). Sample items include, "I feel most successful when I reach personal goals" (mastery goal orientation) and "I feel most successful when I overcome difficulties" (performance goal orientation). Responses were scored on a 5-point scale (1 = totally disagree to 5 = totally agree). The estimated reliability of mastery and performance orientation for the present study was $\alpha = .94$, and $\alpha = .92$, respectively. Furthermore, we controlled for age since older adolescents and adults may be less susceptible to the influence of situational variables (Roberts & Treasure, 1992). Finally, we controlled for gender (Male = 1; female = 2) and academic affiliation (represented by three dummy variables) because these variables could affect the relationships under investigation.

Results

Preliminary Analyses

Preceding the hypotheses testing, preliminary analyses were also performed to ensure there were no violations of the assumption of normality, linearity or multicollinearity. In this respect, the normal P-P plot for the dependent variable indicated that all the residuals clustered along the line, and values for kurtosis (-.33) and skewness (-.48) did not exceed the +/- 1.0 range, or even the relatively strict +/- 0.5 range, suggesting that the assumption of normality has been met. Furthermore, bivariate scatterplots did not reveal any curvilinear trends, indicating that the assumption of linearity had been met. Finally, we inspected pairwise and multiple collinearity using collinearity diagnostics in SPSS. The lowest tolerance value obtained was .59, which is well beyond the threshold of .10 (e.g., Hair, Black, Babin, Anderson & Tatham, 2006).

To further test the construct validity of our measurement model we conducted a confirmatory factor analysis (CFA) using the weighted least squares (WLSMV) estimator of the Mplus program (Muthén, du Toit, & Spisic, 1997). In our confirmatory factor (or measurement) model we allowed the items to load on five separate (but correlated) factors representing mastery climate, performance climate, performance orientation, mastery orientation, and intrinsic motivation. We estimated the measurement model using cluster robust standard errors (at the academy level) since the observations in the dataset are not independent (i.e., individuals clustered within different navy, air force, and army academies). In addition, this model included appropriately correlated disturbance terms, that is, items in the intrinsic motivation scale at T2 were allowed to correlate with the corresponding items in the intrinsic motivation scale at T1. The estimated model provided adequate fit (χ^2 [721] = 1600.41, $p < 0.01$; RMSEA = 0.068; CFI = 0.90) according to frequently used rules of thumb (e.g., Fan, Thompson, & Wang, 1999). Furthermore, the coefficient alpha's ranged from α =

.76 to α = .94, thereby providing evidence of a reliable measurement model. We report descriptive statistics, reliability estimates, and bivariate correlations among the study variables in Table 1. As can be seen in Table 1, mastery climate correlates positively with intrinsic motivation at T1 (r = .27, p < .05) and intrinsic motivation at T2 (r = .31, p < .05). Performance climate, however, did not correlate significantly with intrinsic motivation at T1 (r = -.10, p >.05) or intrinsic motivation at T2 (r = .01, p >.05). Interestingly, we also note that the assumed orthogonality of the motivational climates is supported by the observed non-significant (and close to zero) correlation between mastery and performance climate (r = -.09, p >.05).

Insert Table 1 about here

Primary Analysis

To test the hypotheses, we used hierarchical moderated regression (Cohen, Cohen, West, & Aiken, 2003). Before computing the interaction terms, we centered the predictors to avoid non-essential multicollinearity. We present the results of the hierarchical moderated regression analysis in Table 2. In Step 1, we entered the control variables and intrinsic motivation at T1. Results indicated that when controlling for the initial level of intrinsic motivation at T1 mastery orientation relates positively intrinsic motivation at T2 (β = .17, p < .05). In Step 2, we entered mastery climate at T1. The results indicated when controlling for the initial level of intrinsic motivation at T1 as well as demographics, mastery and performance orientation, there is a positive but not statistically significant relationship between mastery climate and intrinsic motivation at T2 (β = .13, p >.05). Accordingly, Hypothesis 1 was not supported. Next, we entered performance climate in Step 3, and the interaction term (mastery climate × performance climate) in Step 4. The significant interaction term (β = -.23, p < .001) added to the explained variance in intrinsic motivation at T2 (ΔR^2 =

.05, $p < 001$) and showed that the relationship between mastery climate and increased intrinsic motivation is moderated by performance climate. To probe the form of interactions, we followed recommended practice (Aiken & West, 1991) and plotted low versus high scores on mastery climate and performance climate (one standard deviation below and above the means using nonstandardized scores). The results displayed in Figure 1 demonstrate a significant positive relationship between a perceived mastery climate and increased intrinsic motivation for individuals who perceive a low performance climate ($b_{low} = .96$, $p < .001$), and a non-significant relationship for individuals who perceive a high performance climate ($b_{high} = -.23$, $p > .05$). This suggests that a low performance climate in combination with a high mastery climate is crucial for a positive relationship between a mastery climate and increased intrinsic motivation. Accordingly, we received support for Hypothesis 2.

Insert Table 2 about here

Insert Figure 1 about here

Discussion

In this study, we sought to improve our understanding of the motivational climate and adaptive individual outcomes by examining the interplay between mastery climate and performance climate in predicting intrinsic motivation. Our findings should contribute to the AGT and SDT literature by clarifying the interactive (multiplicative) impact of situational criteria (i.e., mastery and performance climates), in relation to an adaptive individual outcome (i.e., intrinsic motivation) (cf., Ames, 1992b; Moreno, et al., 2010).

First, although previous research (e.g., Brunel, 1999; Harwood, et al. 2015; Ntoumanis & Biddle, 1999; Parish & Treasure, 2003) has found a positive relationship between mastery

climate and intrinsic motivation, we did not find a significant relationship between mastery climate at T1 and intrinsic motivation at T2 after controlling for initial levels of intrinsic motivation at T1. Hence, we did not obtain support for the hypothesized positive relationship between mastery climate and *increased* intrinsic motivation. However, the non-significant direct relationship is of less relevance since we obtained support for an interaction of mastery climate and performance climate in relation to an individual's increased intrinsic motivation. The form of interaction demonstrates a positive relationship between mastery climate and increased intrinsic motivation for individuals perceiving a low performance climate, and no relationship between mastery climate and increased intrinsic motivation for individuals perceiving a high performance climate. Hence, our results indicate that a low level of a performance climate is crucial for a positive relationship between mastery climate and increased intrinsic motivation. One explanation for this may be that providing individuals with incentives (performance climate) increases the likelihood that they view the activity as externally driven rather than intrinsically appealing. A high performance climate may therefore render individuals less likely to respond to a mastery climate (which rewards self-improvement, progress, cooperation) with higher levels of intrinsic motivation because the value orientation of a performance climate undermines the mastery climate's facilitation of values directed at enhancing self-referenced criteria of success and need satisfaction (cf. Gagné & Deci, 2005). Stated differently, a performance climate's emphasis on extrinsic benefits and "winning" may "crowd out" intrinsic motivation for those perceiving a high mastery climate.

In sum, our findings suggest that even though a mastery climate typically is seen as a climate facilitating adaptive outcomes (e.g., Harwood, et al. 2015; Ntoumanis & Biddle, 1999), this might not be the case when combined with a performance climate. In this respect, our data support Ames (1992a) in that steps should be taken to promote a mastery climate,

and in terms of intrinsic motivation as an outcome, strongly object to the conclusion by Ommundsen and Roberts (1999, p. 396) that "it may be equally beneficial from a motivation perspective to couple a performance oriented climate with a mastery oriented one" since it would be substituting "a performance-oriented climate in sport with a mastery-oriented one" (Ommundsen & Roberts, 1999, p. 396).

Limitations, Strengths, and Research Directions

The main strength of the present study is that it is based on a longitudinal research design. The longitudinal design allowed us to establish temporal relationships between mastery climate, performance climate, and intrinsic motivation, and by controlling for initial levels of intrinsic motivation we were able to predict *increased* intrinsic motivation. Still, our data were correlational, and causal inferences need to be treated with caution. For causal inferences to be drawn, experimental studies would be necessary. Another limitation is our reliance on self-reported data which are susceptible to common method bias and inflated ratings (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Still, we attempted to minimize common method bias by following remedies suggested by Podsakoff et al. (2003), such as emphasizing confidentiality and separating the measurement of the independent and dependent variables in time. Finally, the problem of generalizability poses a potential limitation since our sample is characterized by mostly male respondents currently enrolled in a military academy. Accordingly, future research should investigate the generalizeability of our findings across different contexts to see whether similar results are obtained.

Perspective

The present study may offer some important practical implications. Most important, the data suggest that introducing performance-involving criteria into a high mastery climate

should be avoided, as this eliminates the positive relationship between the latter and intrinsic motivation. Accordingly, as other researchers have argued (e.g., Duda, 1996) managers, sports coaches, and organizations may wish to draw on this finding and cultivate more mastery-involving and less performance-involving achievement contexts. Exemplary mastery practices can be integrated into a daily routine to enhance adaptive motivation and beneficial outcomes. In this respect, Ames (1992b) suggested that there are certain features of an adaptive mastery climate. These include designing meaningful tasks which include challenge, variety, diversity (Roberts, 2012), giving individuals a choice in terms of having the authority to choose the strategies they want to use to complete a task (Valentini & Rudisill, 2006), and recognizing individuals' effort, progress, and improvements privately and not in comparison to significant others (Ames, 1992b). In essence, the important goal of facilitating a mastery climate is to enhance equal fulfillment of potential, meaning that everybody should be able to achieve the best that is possible for them, not only the more able or the talented (cf., Nicholls, 1979).

References

Ames C. Competitive, cooperative, and individualistic goal structures: A cognitive-motivational analysis. In: Ames R, Ames C, editors. Research on motivation in education: Student motivation. Florida: Academic Press, INC; 1984.

Ames C. Classrooms: Goals, structures, and student motivation. Journal of Educational Psychology. 1992;84:261-71.

Ames, C. (1992b). Classrooms: Goals, structures, and student motivation. *Journal of Educational Psychology, 84*, 261-271.

Ames C. Achievement goals, motivational climate, and motivational processes. In: Roberts GC, editor. Motivation in sport and exercise. Champaign, IL: Human Kinetics; 1992. p. 161-76.

Ames C, Ames R. Goal structures and motivation. The Elementary School Journal. 1984;85:39-52.

Ames C, Ames R. Systems of student and teacher motivation: Toward a qualitative definition. Journal of Educational Psychology. 1984;76(4):536-56.

Brunel PC. Relationship between achievement goal orientations and perceived motivational climate on intrinsic motivation. Scandinavian Journal of Medicine & Science in Sports. 1999;9(6):365-374.

Černe M, Nerstad CGL, Dysvik A, Škerlavaj M. What goes around comes around: Knowledge hiding, perceived motivational climate, and creativity. Academy of Management Journal. 2014;57(1):172-92.

Cohen J, Cohen P, West SG, Aiken LS. Applied multiple regression/correlation analysis for the behavioral sciences. 3rd ed. London, UK: Erlbaum; 2003.

Deci EL, Ryan RM. Intrinsic motivation and self-determination in human behavior. New York: Plenum; 1985.

Deci EL, Ryan RM. The 'what' and 'why' of goal pursuits: Human needs and the self-determination of behavior. Psychological Inquiry. 2000;11(4):227-68.

Deci EL, Ryan RM, Williams GC. Need satisfaction and the self-regulation of learning. Learning and Individual Differences. 1996;8(3):165-83.

DeShon RP, Gillespie JZ. A Motivated Action Theory Account of Goal Orientation, Journal of Applied Psychology. 2005:90(6):1096-1127.

Duda JL. Maximizing motivation in sport and physical education among children and adolescents: The case for greater task involvement. Quest. 1996;48:290-302.

Fan XB, Thompson B, Wang L. Effects of sample size, estimation method, and model specification on structural equation modeling fit indices. Structural Equation Modeling: A Multidisciplinary Journal. 1999;6:56-83.

Gagné M, Deci EL. Self-determination theory and work motivation. Journal of Organizational Behavior. 2005;26(4):331-62.

Guay F, Vallerand RJ, Blanchard CM. On the assessment of state intrinsic and extrinsic motivation: The situational motivation scale (SIMS). Motivation and Emotion. 2000;24:175-213.

Hair JF, Black WC, Babin BJ, Anderson RE, Tatham RL. Multivariate data analysis, 6th edn, Prentice Hall, Upper Saddle River, N.J; 2006.

Harwood CG, Keegan RJ., Smith JMJ, Raine AS. A systematic review of the intrapersonal correlates of motivational climate perceptions in sport and physical activity. Psychology of Sport and Excercise. 2015; 18:9-25.

Jaakkola T, Ntoumanis N, Liukkonen J. Motivational climate, goal orientation, perceived sport ability, and enjoyment within Finnish junior ice hockey players. Scandinavian Journal of Medicine & Science in Sports. 2015. doi: 10.1111/sms.12410

Lau S, Nie Y. Interplay between personal goals and classroom goal structures in predicting student outcomes: A multilevel analysis of person-context interactions. Journal of Educational Psychology. 2008;100(1):15-29.

Miller BW, Roberts GC, Ommundsen Y. Effect of motivational climate on sportspersonship among competitive youth male and female football players. Scandinavian Journal of Medicine & Science in Sports. 2004;14:192-202.

Moreno JA, González-Cutre D, Sicilia Á, Spray CM. Motivation in the exercise setting: Integrating constructs from the approach–avoidance achievement goal framework and self-determination theory. Psychology of Sport and Exercise. 2010;11(6):542-50.

Muthén BO, du Toit SHC, Spisic D. Robust inference using weighted least squares and quadratic estimating equations in latent variable modeling with categorical and continuous outcomes. Conditionallly accepted for publication in Psychometrika. 1997.

Nerstad CGL, Roberts GC, Richardsen AM. Achieving success at work: The development and validation of the motivational climate at work questionnaire (MCWQ). J Appl Soc Psychol. 2013;43:2231-50.

Nerstad CGL, Roberts GC, Richardsen AM. Person–Situation Dynamics and Well-Being at Work: An Achievement Goal Theory Perspective. In: Burke RJ, Cooper CL, editors. The fulfilling workplace: The organization's role in achieving individual and organizational health: Gower Publishing; 2013. p. 121-38.

Newton M, Duda JL. The interaction of motivational climate, dispositional goal orientations, and perceived ability in predicting indices of motivation. International Journal of Sport Psychology. 1999;30(1):63-82.

Nicholls JG. Quality and equality in intellectual development: The role of motivation in education. American Psychologist. 1979;34:1071-84.

Nicholls JG. Achievement motivation: Conceptions of ability, subjective experience, mastery choice and performance. Psychological Review. 1984;91(3):328-46.

Nicholls JG. The competitive ethos and democratic education. Cambridge, MA: Harvard University Press.; 1989.

Ntoumanis N, Biddle SJH. A review of motivational climate in physical activity. Journal of Sport Sciences. 1999;17:643-65.

Ommundsen Y, Roberts GC. Effect of motivational climate profiles on motivational indices in team sport. Scandinavian Journal of Medicine & Science in Sports. 1999;9(6):389-97.

Ommundsen Y, Lemyre PN, Abrahamsen F, Roberts GC. The motivational climate, need satisfaction, regulation of motivation and subjective vitality: A study of young soccer players. International Journal of Sport Psychology. 2010;41(3):216-242.

Parish LE, Treasure DC. Physical Activity and Situational Motivation in Physical Education: Influence of the Motivational Climate and Perceived Ability. Research Quarterly for Exercise and Sport. 2003;74(2):173-82.

Pensgaard AM, Roberts GC. Elite athletes' experiences of the motivational climate: the coach matters. Scandinavian Journal of Medicine & Science in Sports. 2002;12(1):54-9.

Podsakoff PM, MacKenzie SB, Lee J-Y, Podsakoff NP. Common method biases in behavioral research: A critical review of the literature and recommended remedies. Journal of Applied Psychology. 2003;88(5):879-903

Roberts GC. Motivation in sport and exercise from an achievement goal theory perspective: After 30 years, where are we? In: Roberts GC, Treasure DC, editors. Advances in motivation in sport and exercise. Champaign, IL.: Human Kinetics; 2012. p. 5-58.

Roberts GC, Ommundsen Y. Effect of goal orientation on achievement beliefs, cognition and strategies in team sport. Scandinavian Journal of Medicine & Science in Sports. 1996;6(1):46-56.

Roberts GC, Treasure DC. Children in sport. Sport Science Review. 1992;2:46-64.

Roberts GC, Treasure DC, Balague G. Achievement goals in sport: The development and validation of the perception of success questionnaire. Journal of Sports Sciences. 1998;16(4):337-47.

Ryan RM, Deci E. An overview of self-determination theory: An organismic-dialectical perspective. In: Deci E, Ryan RM, editors. Handbook of self-determination research. Rochester, NY: The University of Rochester Press; 2002. p. 3-36.

Sookermany AM. What is a Skillful Soldier? An Epistemological Foundation for Understanding Military Skill Acquisition in (Post) Modernized Armed Forces. Armed Forces & Society. 2012:38(4):582-603.

Standage M, Duda JL, Ntoumanis N. A model of contextual motivation in physical education: Using constructs from self-determination and achievement goal theories to predict physical activity intentions. Journal of Educational Psychology. 2003;95(1):97-110.

Standage M, Treasure DC, Duda JL, Prusak KA. Validity, reliability, and invariance of the Situational Motivation Scale (SIMS) across diverse physical activity contexts. Journal of Sport & Exercise Psychology. 2003; 25:19–43.

Valentini N, Rudisill ME. Goal orientation and mastery climate: A review of contemporary research and insights to intervention. Estudos de Psicologia. 2006;23:159-71.

Vallerand RJ, Gauvin LI, Halliwell WR. Negative Effects of Competition on Children's Intrinsic Motivation. The Journal of Social Psychology. 1986;126(5):649-56.

Table 1

Descriptive Statistics, Scale Reliabilities and Correlations

	Mean	*SD*	1	2	3	4	5	6	7	8	9	10	
1. Age	23.61	2.63											
2. Gender [a]	1.10	.30	-.06										
3. Academy A	.40	.49	.11	-.16**									
4. Academy B	.36	.48	.00	.09	-.61**								
5. Academy C	.24	.43	-.13*	.08	-.46**	-.42**							
6. Mastery orientation T1	4.17	.87	-.01	.02	.21**	-.10	-.13*	(.94)					
7. Performance orientation T1	3.03	.96	-.16*	-.08	.07	-.08	.01	.15**	(.92)				
8. Mastery climate T1	3.75	.62	.01	-.19**	.28**	-.18**	-.12	.45**	.09	(.76)			
9. Performance climate T1	3.09	.61	.02	-.08	.14*	-.12	-.04	-.15*	.32**	-.09	(.79)		
10. Intrinsic motivation T1	5.06	1.16	-.10	.06	.14*	-.16*	.02	.11	.11	.27**	-.10	(.87)	
11. Intrinsic motivation T2	4.72	1.40	.01	-.01	.29**	-.14	-.19*	.25**	.17	.31**	.01	.61**	(.91)

Note: n = 248 (T1), n = 141 (T2). [a] Male = 1; female = 2. Estimated reliabilities are displayed on the diagonal.

* $p < .05$
** $p < .01$

Table 2

Results of Hierarchical Moderated Regression Analyses

	Intrinsic motivation T2			
	Step 1	Step 2	Step 3	Step 4
Variables	β	β	β	β
Age	.05	.06	.07	.07
Gender [a]	.04	.07	.07	.08
Academy A	-.11	-.09	-.07	-.07
Academy B	-.22**	-.22**	-.21**	-.18*
Mastery orientation T1	.17*	.11	.13	.18*
Performance orientation T2	.10	.10	.08	.09
Intrinsic motivation T1	.55***	.52***	.53***	.49***
Mastery climate T1		.13	.13	.16
Performance climate T1			.06	.10
Mastery climate T1 × Performance climate T1				-.23***
R^2	.45	.46	.46	.51
ΔR^2		.01	.00	.05***
F	15.58***	14.04***	12.53***	13.46***
df	7, 132	1, 131	1, 130	1, 129
ΔF		2.22	.70	12.19***

Note. $N = 141$.

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

[a] Male = 1; female = 2.

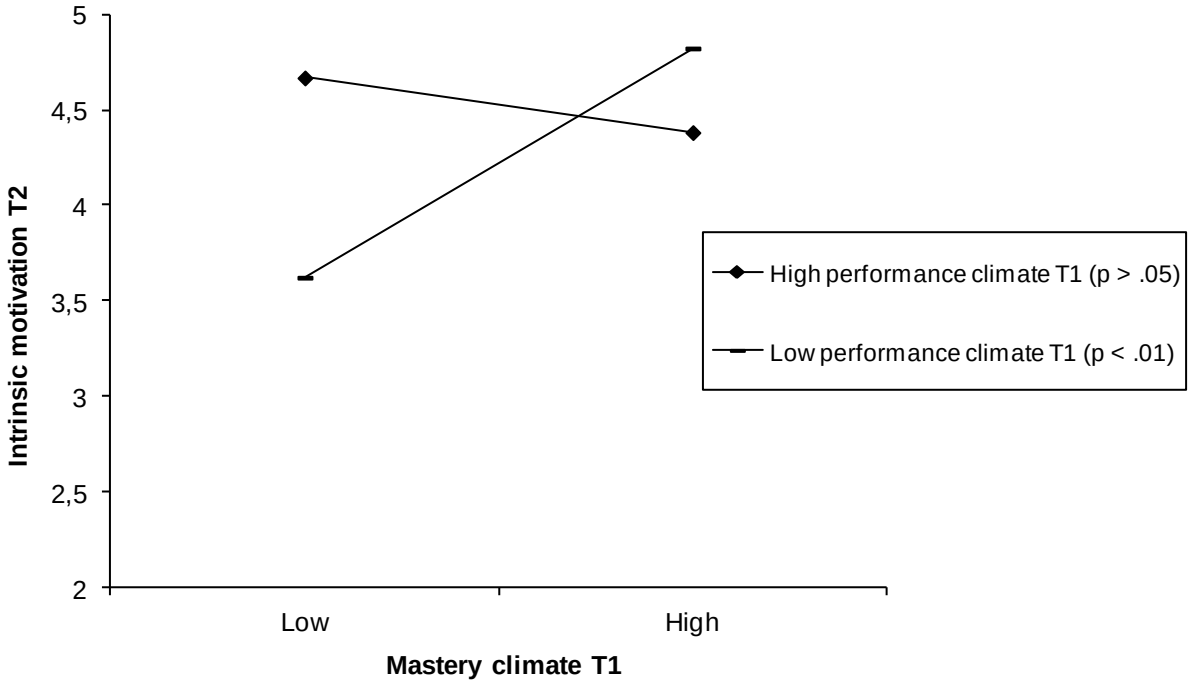

Figure 1. The moderating role of performance climate on the relationship between mastery climate and increased intrinsic motivation.