Is coaches’ behavior patterns reflected in their team’s motivational climate?

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Acknowledgements

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Knowledge is lacking regarding objective situational cues affecting athletes’ perceptions of the motivational climate. The present study examined one proposed objective situational cue, namely the behavior of coaches. It was expected that differences between coaches’ behavior patterns would be reflected in differences in the motivational climates between their teams. Four junior soccer team coaches and 56 players from these four teams participated in the study. Coaches were observed during four practices and behaviors were recorded using the Coaching Behavior Assessment System. Players completed the Perceived Motivational Climate in Sport Questionnaire-2. More encouraging and instructional behaviors from coaches were reflected by a higher perceived mastery climate, especially in regard to perceiving the climate as rewarding for effort and improvement. Less encouraging and instructional behaviors were reflected by higher perceived performance climate. Higher levels of punitive behaviors were also reflected by higher perceived performance climate. Not only active behavior patterns in coaches but also passive behavior patterns affect the perceived motivational climate in team sports.

A common notion in competitive sports is that individuals in leadership positions can affect the environment through their perceptions of success. At the elite level, coaches are often perceived as the cause of success or failure, which is clearly illustrated by frequent replacement of coaches in sports such as soccer or ice hockey. Regardless of level, the potential impact of coaches on the psychological climate is perceived as important, in consideration to athletes’ performance, personal development and well-being. But how do coaches induce this psychological climate? Observational research and inclusion of the athletes’ perceptions of the environment in which they perform and their motivation within a social-cognitive framework has been used for answering this intriguing question. The dominating approach has been the achievement goal theory and related constructs, such as the motivational climate, stemming from the early work in the field of educational psychology (e.g., Ames, 1992a; Dweck, 1986; Nicholls, 1984, 1989). A central tenet of the achievement goal approach is how individuals interpret achievement and competence and how they perceive the environment in which they operate. In order to understand the influence coaches have on the psychological climate, it is also important to understand individual views on achievement and different meanings attached to achievement striving.

Achievement Goals and the Motivational Climate
Research in the sport and exercise setting is based on the early work of Ames (1992a, 1992b), Dweck (1986), and Nicholls (1984, 1989). Some basic assumptions underlies
the achievement goal theory, such as the display of different goals when striving towards demonstrating competence in achievement settings and the perception of ability as a common feature of achievement striving. It is argued that at least two major achievement goal perspectives exist, one self-referenced (mastery orientation) and one normatively-referenced (performance orientation), and that variations in achievement goal orientations underlie observed differences in individuals’ achievement-related cognitions, affects and behaviors. Other concepts used in the literature are for example task/ego, but to avoid confusion the two orientations will hereinafter only be defined as mastery/performance according to Ames (1992b) and Ames and Archer’s (1988) terminology.

Nicholls (1984, 1989) argued that perception of success and failure is linked to individuals’ perception whether they demonstrated high or low ability. The subjective experience of success or failure is based on the individual’s conception of ability, which stems from a mastery and/or performance orientation. Nicholls considered these dispositions as orthogonal, meaning that these orientations are not fixed and an individual can report high levels of both, low levels of both or high in mastery and low in performance or the opposite and fluctuations of dispositions can occur. The individual view of ability derives from both dispositional and situational factors and Nicholls (1992) points out that “there are much more to achievement-related cognition than conceptions of ability” (p. 42) but also concludes that individuals’ conceptions and perceptions of current capacity is highly relevant when trying to predict achievement patterns. This is in line with previous findings where different behavioral patterns were adopted as a consequence of mastery or performance orientations, particular in response to failure (Dweck, 1986; Dweck & Legget, 1988; Elliot & Dweck, 1988). These findings suggest that perceived ability, how individuals’ behave when facing challenges and the task emphasis (mastery or performance) affects individuals’ responses. Consequently it appears that achievement goals are critical when determining these response patterns and that mastery goals and a mastery orientation promotes adaptive patterns while performance goals and a performance orientation promote maladaptive patterns.

The achievement goal theory emphasizes the situations role in the motivation process (e.g., Ames, 1992a; Dweck, 1986; Nicholls, 1984, 1989). Central to the achievement goal perspective is how the environment influences achievement behaviors. That is, how the individual experience the situation affects the degree to which a mastery or performance approach is perceived as appropriate. Depending on this perception, adaptive or maladaptive motivation patterns will be adopted by the individual, which in turn will affect behaviors, cognitions and affective responses. The individual does not achieve anything in social vacuum. Guidelines, expectations, and values of the social group therefore play a significant role in choosing and persisting behaviors (Maehr, 1974).

The Coach-Created Motivational Climate in Sports
When turning to the sport and exercise setting, less is known about the environmental influences on motivation than the dispositional achievement goals. Although a
A growing body of literature is focusing on the motivational climate and environmental influences on motivation (Duda, 2005). When referring to the motivational climate, focus is often on the learning environment that is affecting athletes’ thoughts, feelings and behaviors in achievement contexts. A climate that is coach-created reflects what coaches’ recognize, value and evaluate regarding their athletes’ performance and learning. This has consequences for the athletes’ psychosocial and behavioral responses. In a mastery-oriented climate, coaches’ encourage effort, improvement, learning and skill development and success and competence is based on self-referenced criteria. From a learning perspective, mistakes are seen as part of the developmental process and feedback is given to athletes with the aim of helping them in subsequent attempts towards task mastery. On the other hand, a performance climate promotes normative standards regarding success and competence where outperforming others is praised and social comparisons are frequently used. Mistakes are followed by punitive feedback due to task failure and lack of ability (Ames, 1992b).

In a meta-analysis conducted on the motivational climate in physical activity and sport, estimations of effect sizes from 14 studies including 4484 individuals were used to examine the impact of the motivational climate in sport end exercise settings on affective and cognitive responses (Ntoumanis & Biddle, 1999). The results showed that a mastery climate was associated with adaptive cognitive and affective patterns, for example increased enjoyment, effort, perceived competence, self-efficacy and a mastery orientation. A performance climate was associated with maladaptive or at least less adaptive patterns, such as increased performance anxiety and worry, focus on ability and performance orientation. Several studies have highlighted the positive influence of a mastery-oriented climate and the potential negative impact of a performance-oriented climate (e.g., Kuzcka & Treasure, 2005; Lemyre, Hall & Roberts, 2008; Miller, Roberts & Ommundsen, 2005; Reinboth & Duda, 2006).

Research on the motivational climate related to the coach has shown similar tendencies. Among elite athletes, a perceived coach-created mastery climate predicted greater perceived individual and team improvement, higher performance satisfaction and more positive ratings of the coach. A coach-created performance climate was instead negatively associated with coach ratings but positively related to the players’ satisfaction with the team’s competitive result (Balaguer, Duda, Atienza & Maya, 2002).

A perceived coach-created mastery climate has been positively related to higher levels of closeness, commitment and complementarity with the coach. In contrast, a perceived coach-created performance climate has been associated with the opposite (Olympiou, Jowett & Duda, 2008).

Results strengthening the importance of coaches’ feedback as a creator of the motivational climate have been found in in-depth interviews with elite athletes. A coach-created mastery climate was strongly preferred and perceived as conducive in regard to both performance and well-being. Coaches’ feedback, what they said and
when they said it and how they behaved towards the athletes emerged as important aspects related to the perceived motivational climate (Pensgaard & Roberts, 2002).

Similar results were found among adolescent athletes. Through semi-structured interviews in focus-groups, a strong motivational antecedent emerged in coaches’ feedback behavior, particularly through their verbal feedback and behavioral reinforcement. When coaches engaged in positive feedback it was generally seen as a positive influence on motivation whereas negative feedback was seen as a negative influence. Rewards for desirable behaviors, for example effort, was generally seen as positive for the athletes’ experience and the opposite that punitive behaviors were related to negative affect and avoidance behaviors (Keegan, Spray, Harwood & Lavallee, 2010).

Attempts to alter the motivational climate have been made through coach training with promising results. When an intervention group of coaches trained to become more mastery oriented was compared to a control group, coaches in the intervention group were perceived as more mastery oriented by their athletes and these athletes’ decreased their performance anxiety over the course of the season. Athletes’ playing for coaches in the control groups increased their performance anxiety over the course of the season (Smith, Smoll & Cumming, 2007).

The motivational climate intervention used was based on the behaviors from the Coaching Behavior Assessment System (CBAS) (Smith, Smoll & Hunt, 1977a) and guidelines from the Coach Effectiveness Training (CET) (Smith, Smoll & Curtis, 1979). CET is a cognitive-behavioral training-program for youth sport coaches consisting of behavioral guidelines with the intention to increase reinforcing, encouraging and supportive behaviors and decrease punitive behaviors. An extensive amount of observational studies of coaches’ behaviors have been conducted using the CBAS following CET interventions. The results show that CET-trained coaches engage in more reinforcing, encouraging and supportive behaviors than non-trained coaches (e.g., Smith et al., 1979). As a consequence of this behavior change, young athletes coached by CET-trained coaches have reported reduced sport performance anxiety (Smith, Smoll, & Barnett, 1995; Smith et al., 2007), increased self-esteem, particularly among those with low self-esteem (Smith & Smoll, 1990; Smoll, Smith, Barnett & Everett, 1993), a more positive evaluation of the coach, a better team atmosphere, having more fun and teams reporting lower levels of attrition (Smoll & Smith, 2002).

CBAS and CET derives from the Meditational Model of Leadership (Smoll, Smith, Curtis & Hunt, 1978; Smoll & Smith, 1989), suggesting that athletes’ evaluative reactions towards coaches’ actual behaviors (observed behaviors) are mediated by athletes’ perceptions and recall of coaches’ behaviors. Assumptions about moderators of this mediated relationship are also made, such as nature of sport, competitive level and goals (see Smith & Smoll, 2007, for a review). Smoll and Smith (1989) suggests that athletes’ cognitive and affective processes acts as a filter between coaches’ behaviors and athletes’ sport experience, but these processes are not explicitly stated within a motivational framework (Duda & Balaguer, 1999).
Social reinforcement from coaches is seen as central to the Meditational Model of Leadership (Smoll & Smith, 1989) and the achievement goal theory emphasizes the social environment as having motivational significance (Ames, 1992b; Nicholls, 1989). More specifically, Ames accentuates how structures established by the coach can facilitate athletes’ adoption of a mastery or performance orientation.

The similarities in athletes’ experiences, deriving from research on the motivational climate and coach behaviors, have resulted in motivational climate interventions for sport coaches based on the CET guidelines (e.g., Smith et al., 2007; Smith & Smoll, 2007). Although alteration of the motivational climate is a growing research field (e.g., Theeboom, De Knop & Weiss 1995; Conde, Almagro, Sáenz-Lopez & Castillo, 2009), this type of work might be ahead of itself (Duda, 2002). There is still a lack of knowledge on the situational structures affecting athletes’ perceptions of the motivational climate, specifically the overlap between the objective mastery and performance situational cues and subjective perceptions of these situational mastery and performance cues (Duda & Balaguer, 2007; Smith et al., 2007). Because there is a lack of observational instruments objectively tapping these situational cues, existing instruments such as the CBAS could be helpful to target mastery and performance behaviors among coaches (Duda, 2002). Suggestions that the desirable coach behaviors among the CBAS behaviors are more mastery oriented whereas less desirable coach behaviors are more performance oriented has been put forward (Chaumeton & Duda, 1988). Findings among collegiate athletes have strengthened this notion and indicated that athletes who perceived coaches as providers of more instructional and positive feedback were more likely to perceive a mastery climate (Gardner, 1998). As an extension of these findings, the need for research on the antecedents of the motivational climate has been pointed out and addressed. With a questionnaire version of the CBAS observational instrument the relationship between perceived coach behaviors and athletes’ perceived coach-created motivational climate was examined (Smith, Fry, Ethington & Li, 2005). Among female high school athletes, positive and encouraging feedback behaviors from coaches were positively related with the perception of a mastery coach-created climate, whilst punitive feedback behaviors from coaches were positively associated with the perception of a performance coach-created climate. Later studies have replicated these findings, also using a questionnaire version of the CBAS, among female high school soccer teams. Higher perceived mastery climate was positively associated with praise after a desirable performance with or without information and encouragement after mistakes. Perception of higher performance climate was positively associated with criticism after mistakes with or without information and negatively associated with praise after a desirable performance with or without information (Weiss, Amarose & Wilko, 2009).

Despite previous suggestions of coach behaviors as an antecedent to the motivational climate, knowledge on coach behaviors as an objective situational antecedent of the coach-created motivational climate is limited. Therefore, the purpose of the present study was to examine coach behaviors as an objective situational cue affecting the perceived motivational climate in team sports.
More specifically, the present study sought to examine if differences between team sport coaches’ behavior patterns would be reflected in differences in the motivational climate between their teams. Teams having a coach engaged in more encouraging and instructional behaviors were expected to perceive a higher mastery oriented coach-created climate. On the contrary, teams having a coach engaged in more punitive behaviors and less reinforcing and instructional behaviors were expected to be reflected by perceptions of a higher performance oriented coach-created climate.

Methods

Participants

Four male head coaches and 59 players from four junior soccer teams participated in the study. These four teams played on a comparable competitive level. Three players were, however, excluded from the analysis due to lack of sufficient experience of the coach, so a total of 56 players were included in the analyses. Team A (n=12) and Team B (n=17) consisted of male players, Team C (n=13) and Team D (n=14) consisted of female players. Players had a mean age of 17.3 years (SD=1.7). Coaches had a mean age of 28.3 years (SD=5.9) with 6 (SD=0.82) years of coaching experience.

There are no conclusive guidelines for how long it takes for the climate to be established by the coach or team-mates, but suggestions that the motivational climate is likely to be established within two to six weeks has been put forward (Miller & Roberts, 2004). The inclusion criterion in this study was set to four weeks experience of the coach. The players in this study had an average experience of their coach of 4.5 months (SD=3.1).

Instruments

Coach behaviors

Observations of coaches’ behaviors were conducted using a modified version of the Coaching Behavior Assessment System (CBAS) (Smith, et al., 1977a, 1977b). The CBAS is an observation instrument designed for coding and analyzing athletic coaches’ behaviors in naturalistic settings. The CBAS comprises 12 specific behaviors divided into two major behavioral categories: reactive and spontaneous behaviors. The reactive behaviors are coaches’ responses to desirable performances, efforts, mistakes, errors or misbehaviors from players. The spontaneous behaviors are divided into game-relevant or game-irrelevant behaviors. According to Brewer and Jones (2002) observational instruments like the CBAS needs modification when adapted to a different context to secure content validity. Therefore, pilot observations of a variety of soccer coaches and practices were conducted to examine the applicability of the CBAS in a Swedish soccer setting. After the pilot observations two behaviors were omitted, non-reinforcement and ignoring mistakes, in line with
previous research (e.g., Millard, 1996; Smith, Zane, Smoll & Coppel, 1983). These non-behaviors were deemed difficult to score because they require an assumption that the coach has seen the ignored action, not always a justified assumption in the sport context. Additionally, no significant relationship between these behaviors and players attitudes has been found (Smith et al., 1983). Table 1 describes the final modified version of the CBAS adjusted to the Swedish soccer setting, consisting of 10 specific behaviors. Previous studies in different sport settings indicate that the CBAS is sufficient enough to incorporate the majority of behaviors coaches engage in during games and practices, that individual behavioral patterns are distinguishable and have shown adequate reliability (e.g., Chaumeton & Duda, 1988; Curtis, Smith & Smoll, 1979; Smith et al., 1983).

Perceived motivational climate

The motivational climate instrument used was the Perceived Motivational Climate in Sport Questionnaire-2 (PMCSQ-2) (Newton, Duda & Yin, 2000). The PMCSQ-2 targets two higher-order dimensions of athletes’ perceived coach-created motivational climate: mastery and performance oriented climate. Items in the PMCSQ-2 represent these two higher-order dimensions as well as three underlying subscales for each dimension. A steam preceded each item, “On this team...”. The mastery scale measures cooperative learning with four items (e.g., “…the coach encourages players to help each other”), important roles with five items (e.g., “…the coach believes that all of us are crucial to the success of the team”), and effort/improvement with eight items (e.g., “…players feel successful when they improve”). The performance scale measures punishment for mistakes with six items (e.g., “…the coach gets mad when a player makes a mistake”), unequal recognition with seven items (e.g., “…the coach gives most of his or her attention to the stars”), and intra-team rivalry with three items (e.g., “…the coach praises players only when they outplay team-mates”). Participants responded on a 5-point scale from 1 (strongly disagree) to 5 (strongly agree). Previous research with the PMCSQ-2 has supported the instrument’s validity and reliability (e.g., Newton et al., 2000).

The PMCSQ-2 was developed and validated as an English instrument; therefore a translation procedure was necessary for adaption to a Swedish setting. The original English version of the PMCSQ-2 was translated to Swedish and then back-translated by two bilingual individuals. Subsequently, the original was compared to the back-translated versions and differences were discussed. Minor corrections were made, but overall a good agreement was shown between the original and back-translated versions. The mastery climate scale (α=.87) and the performance climate scale (α=.87) showed adequate internal consistency. Four of the subscales showed adequate internal consistency, important role (α=.80), effort/improvement (α=.78), punishment for mistakes (α=.73) and unequal recognition (α=.86). Subscales cooperative learning (α=.67) and intra-team rivalry (α=.59) showed marginal internal consistency, in line with previous research (e.g., Newton et al., 2000; Olympiou et al., 2008). Despite showing marginal internal consistency these subscales were retained for further analysis. There is no definite level for acceptable or unacceptable alpha levels;
measures with low internal consistency might still be useful (e.g., Cronbach, 1960; Schmitt, 1996).

Table 1  
*CBAS behavior categories and definitions*

<table>
<thead>
<tr>
<th>Reactive behaviors</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Response to desirable performances</strong></td>
<td></td>
</tr>
<tr>
<td>Reinforcement</td>
<td>A positive rewarding reaction (verbal or non-verbal) towards one or several players after a good play or effort</td>
</tr>
<tr>
<td><strong>Responses to mistakes/errors</strong></td>
<td></td>
</tr>
<tr>
<td>Mistake-contingent encouragement</td>
<td>Encouragement given to a player after a mistake</td>
</tr>
<tr>
<td>Mistake-contingent technical instruction</td>
<td>Technical/tactical instruction following a mistake instructing or demonstrating a player how to correct a mistake he/she has made</td>
</tr>
<tr>
<td>Punishment</td>
<td>A negative reaction (verbal or non-verbal) following a mistake</td>
</tr>
<tr>
<td>Punitive technical instruction</td>
<td>A technical/tactical instruction following a mistake given in a punitive or hostile manner or a combination of technical/tactical instructions and punitive feedback</td>
</tr>
<tr>
<td><strong>Response to misbehaviors</strong></td>
<td></td>
</tr>
<tr>
<td>Keeping control</td>
<td>Behaviors intended to restore or maintain order among team members</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Spontaneous behaviors</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Game-related</strong></td>
<td></td>
</tr>
<tr>
<td>General technical instruction</td>
<td>Spontaneous instruction in the techniques or tactical aspects of the sport (not following a mistake)</td>
</tr>
<tr>
<td>General encouragement</td>
<td>Spontaneous encouragement which does not follow a mistake</td>
</tr>
<tr>
<td>Organization</td>
<td>Administrative behavior that sets the stage for practice by assigning duties, responsibilities, positions, etc.</td>
</tr>
<tr>
<td><strong>Game-irrelevant</strong></td>
<td></td>
</tr>
<tr>
<td>General communication</td>
<td>Communication with players unrelated to the practice</td>
</tr>
</tbody>
</table>

*Note.* Adapted from Smith, Zane, Smoll & Coppel (1983).
Procedure

*Video recording procedure*
Each coach was videotaped during four practice sessions within a two-week period. The rationale for using several recordings in a short period of time was to get an average measure of the coaches’ behaviors. Practice sessions were videotaped with Panasonic NV-GS300 video camera mounted on a tripod (Manfrotto 190 XB) located outside the soccer field, not interfering with player or coach activities. In order to accurately record verbal behaviors, each coach wore a wireless omni-directional microphone (Sennheiser ew-100 G2) with a hip-mounted transmitter. Connected to the camera was a wireless receiver (Sennheiser ew-100 G2) allowing visual and verbal signals to be recorded simultaneously.

*Coding procedure*
All of the videotaped practices were coded by the author, using event recording (van der Mars, 1989). Event recordings are appropriate for collecting data of occurrences of discrete events, calculated by frequency of these discrete events. Observer training was conducted through training with the CBAS manual (Smith et al., 1977b), reviewing research literature where the CBAS has been used, as well as pilot observations to get familiar with the soccer setting.

Behaviors during practice sessions were coded starting when the coach announced that the practice had started until the practice was called off. Team meetings prior to or after the practice session out on the practice field were coded if the content of the meeting was related to the subsequent or previous practice session. If the content of the meeting was related to the previous game, subsequent game or not related to the practice it was not included. If coaches actively participated in practice activities (e.g., during game-play), those particular segments were excluded from coding. Due to microphone failure, ten minutes of one coach was excluded from the coding procedure.

*Questionnaire procedure*
After initial contact and approval from the four coaches, a meeting was arranged with the players of the teams. A separate meeting was held with each of the four teams. During these meetings, players received verbal and written information about the study and gave their consent to participate before the study commenced. Players were informed that participation was voluntary and that their anonymity was guaranteed. All of the present players completed the survey including demographic variables and the PMCSQ-2. Players were asked to answer items honestly and the author was present if any questions arose. The coaches completed a survey on background variables during these meetings.

Results
Coach behaviors
To assess reliability in the behavior coding an intra-rater reliability procedure was conducted according to previous guidelines (Brewer & Jones, 2002; van der Mars, 1989). This procedure comprised coding a recorded 20-minute “reliability” segment for each coach. These segments were recoded seven days later. The latter coding was compared to the original coding with an intra-rater agreement formula: agreements/(agreements+disagreements)*100. Unit of measurement in the reliability coding was the absolute frequency of behaviors. Across behaviors the mean reliability percentage was 93 % (range 81.3-100%) Halfway through the coding of the 16 videotaped practice sessions, an additional reliability coding of the same 20-minute segments was conducted and compared to the original coding. The reliability percentage mean across behaviors was 94 % (range 77.4-100 %). This was in line with previous suggestions for adequate reliability percentage of 80-85 % (van der Mars, 1989), except for the organizational behavior category (77.4 %). The organizational behaviors were therefore omitted from further analysis.

In total (after excluding organizational behaviors) 2982 discrete behaviors during the 16 practice sessions were coded. The duration of the 16 coded practice sessions was 1051.5 minutes (practice session mean =65.8, SD=10). The frequency of each behavior as a proportion of all behaviors was calculated through percentage and rate per minute (RPM). RPM was considered the most accurate measure when comparing behaviors between the four coaches, since the total amount of minutes coded for each coach differed (see e.g., Ford, Yates & Williams, 2010). The four coaches’ behavior patterns are presented in Table 2. Comparisons and classifications below are made in comparison to the other coaches in the present study.

Coach A was classified as a passive coach, not very engaged in interactions with the players during practices. Reinforcement, general technical instructions and general communication consisted of 90.7 % of the observed behaviors, although the RPM was very low, 0.17, 0.10 and 0.11 respectively.

Coach B was classified as a very active coach, highly engaged in interactions with players during practices. Coach B displayed the highest levels of RPM for all behaviors except keeping control and general communication. Especially reinforcement (RPM=2.2) and general technical instructions (RPM=1.8) were frequently occurring behaviors, but also punitive behaviors occurred quite frequently. Coach B focused primarily on reinforcing behaviors.

Coach C was classified as an averagely active coach in regard to interactions with the players. General technical instructions (RPM=1.1) occurred frequently and reinforcement (RPM=0.51) occurred quite frequently. Coach C also displayed high levels of mistake-contingent technical instructions (RPM=0.17) in comparison to Coach A and D.

Coach D was also classified as an averagely active coach, regarding interactions with the players. Coach D had a similar profile as Coach C but displayed lower levels of mistake-contingent technical instructions (RPM=0.09). Both coach C and D focused primarily on instructional behaviors.
<table>
<thead>
<tr>
<th>Behavior Pattern</th>
<th>Coach A</th>
<th></th>
<th></th>
<th>Coach B</th>
<th></th>
<th></th>
<th>Coach C</th>
<th></th>
<th></th>
<th>Coach D</th>
<th></th>
<th></th>
<th>Total</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Reinforcement</td>
<td>Freq.</td>
<td>%</td>
<td>RPM</td>
<td>Freq.</td>
<td>%</td>
<td>RPM</td>
<td>Freq.</td>
<td>%</td>
<td>RPM</td>
<td>Freq.</td>
<td>%</td>
<td>RPM</td>
<td>Freq.</td>
<td>%</td>
<td>RPM</td>
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<tr>
<td>Mistake-contingent encouragement</td>
<td>39</td>
<td>40.2</td>
<td>0.17</td>
<td>565</td>
<td>35.3</td>
<td>2.24</td>
<td>153</td>
<td>24.3</td>
<td>0.51</td>
<td>152</td>
<td>23.2</td>
<td>0.55</td>
<td>909</td>
<td>30.5</td>
<td>0.86</td>
</tr>
<tr>
<td>Mistake-contingent technical instruction</td>
<td>2</td>
<td>2.1</td>
<td>0.01</td>
<td>129</td>
<td>8.1</td>
<td>0.51</td>
<td>7</td>
<td>1.1</td>
<td>0.02</td>
<td>20</td>
<td>3.1</td>
<td>0.07</td>
<td>158</td>
<td>5.3</td>
<td>0.15</td>
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<tr>
<td>Punishment</td>
<td>3</td>
<td>3.1</td>
<td>0.01</td>
<td>50</td>
<td>3.1</td>
<td>0.20</td>
<td>52</td>
<td>8.2</td>
<td>0.17</td>
<td>25</td>
<td>3.8</td>
<td>0.09</td>
<td>130</td>
<td>4.4</td>
<td>0.12</td>
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<tr>
<td>Punitive technical instruction</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>113</td>
<td>7.1</td>
<td>0.45</td>
<td>30</td>
<td>4.8</td>
<td>0.10</td>
<td>15</td>
<td>2.3</td>
<td>0.05</td>
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<tr>
<td>Keeping control</td>
<td>3</td>
<td>3.1</td>
<td>0.01</td>
<td>12</td>
<td>0.8</td>
<td>0.05</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>13</td>
<td>2.0</td>
<td>0.05</td>
<td>28</td>
<td>0.9</td>
<td>0.03</td>
</tr>
<tr>
<td>General technical instruction</td>
<td>23</td>
<td>23.7</td>
<td>0.10</td>
<td>457</td>
<td>28.6</td>
<td>1.81</td>
<td>324</td>
<td>51.4</td>
<td>1.09</td>
<td>353</td>
<td>53.9</td>
<td>1.28</td>
<td>1157</td>
<td>38.8</td>
<td>1.10</td>
</tr>
<tr>
<td>General encouragement</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>174</td>
<td>10.9</td>
<td>0.69</td>
<td>32</td>
<td>5.1</td>
<td>0.11</td>
<td>64</td>
<td>9.8</td>
<td>0.23</td>
</tr>
<tr>
<td>General communication</td>
<td>26</td>
<td>26.8</td>
<td>0.11</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0.3</td>
<td>0.01</td>
<td>4</td>
<td>0.6</td>
<td>0.01</td>
<td>32</td>
<td>1.1</td>
<td>0.03</td>
</tr>
<tr>
<td>Total</td>
<td>97</td>
<td>100</td>
<td>0.43</td>
<td>1599</td>
<td>100</td>
<td>6.35</td>
<td>631</td>
<td>100</td>
<td>2.12</td>
<td>655</td>
<td>100</td>
<td>2.38</td>
<td>2982</td>
<td>100</td>
<td>2.84</td>
</tr>
</tbody>
</table>
Perceived motivational climate

Differences in the motivational climate between the four teams were assessed through a Multivariate analysis of variance (MANOVA). The higher-order dimensions mastery climate and performance climate and subscales cooperative learning, important role, effort/improvement, punishment for mistakes, unequal recognition and intra-team rivalry was used as dependent variables. Team was used as independent variable. Preliminary assumption testing revealed singularity among the dependent variables after bivariate correlations between the higher-order dimensions and their respective subscales (see Table 3). According to previous guidelines, variables highly correlated should be removed from the analysis or composite scores should be created (Tabachnick & Fidell, 2007). Therefore, subscales highly correlated (above .70) with the higher-order dimensions were removed from the analysis. In the final analysis the two higher-order dimensions mastery and performance climate and subscale effort/improvement was included. Statistical significance was set to $p < .05$. For post-hoc pairwise comparisons the Bonferroni correction method was used.

Table 3

<table>
<thead>
<tr>
<th>Correlations between the higher-order dimensions and their respective subscales</th>
<th>Mastery</th>
<th>Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooperative learning</td>
<td>.84**</td>
<td></td>
</tr>
<tr>
<td>Important role</td>
<td>.77**</td>
<td></td>
</tr>
<tr>
<td>Effort/improvement</td>
<td>.63**</td>
<td></td>
</tr>
<tr>
<td>Punishment for mistakes</td>
<td></td>
<td>.86**</td>
</tr>
<tr>
<td>Unequal recognition</td>
<td></td>
<td>.95**</td>
</tr>
<tr>
<td>Intra team rivalry</td>
<td></td>
<td>.72**</td>
</tr>
</tbody>
</table>

**$p < .01$**

There was a significant effect of team on the perceived coach-created motivational climate, Wilks’ $\Lambda = .26$, $F (9, 121.84) = 9.93$, $p < .001$, $\eta^2 = .36$. The post-hoc tests revealed significant team effects on perceived mastery climate, $F (3, 52) = 6.16$, $p < .01$, $\eta^2 = .26$, Team A perceived the climate as less mastery oriented than Team B, C, and D. Significant differences were also displayed on perceived performance climate, $F (3, 52) = 6.07$, $p < .01$, $\eta^2 = .26$, Team C perceived the climate as less performance oriented than Team A and B. Significant differences were found on the effort/improvement scale, $F (3, 52) = 10.95$, $p < .001$, $\eta^2 = .39$. Team B perceived the climate as more rewarding for effort and improvement than Team A, C and D (see Table 4 for means and standard deviations).

To further examine how these four teams motivational climate differed, the MANOVA was followed up by a discriminant analysis. The discriminant analysis was conducted to more closely assess how the outcome variables, mastery climate, performance climate and the effort/improvement subscale, together contributed to the discrimination between the four teams and predicted team belonging. The outcome variables were used as predictors and team as grouping variable. The analysis revealed three discriminant functions, the first explaining 82.2% of the variance,
Table 4

Coaches’ behavior classification and teams’ motivational climate scores, means and standard deviations are presented.

<table>
<thead>
<tr>
<th></th>
<th>Team A</th>
<th>Team B</th>
<th>Team C</th>
<th>Team D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coach</td>
<td>Passive</td>
<td>Active</td>
<td>Average</td>
<td>Average</td>
</tr>
<tr>
<td>Mastery</td>
<td>3.5 (.48)</td>
<td>4.0 (.53)</td>
<td>4.2 (.34)</td>
<td>4.1 (.45)</td>
</tr>
<tr>
<td>Performance</td>
<td>2.4 (.58)</td>
<td>2.4 (.56)</td>
<td>1.7 (.37)</td>
<td>1.9 (.61)</td>
</tr>
<tr>
<td>Effort/improvement</td>
<td>3.4 (.59)</td>
<td>4.2 (.51)</td>
<td>3.5 (.27)</td>
<td>3.4 (.37)</td>
</tr>
</tbody>
</table>

canonical $R^2 = .65$, the second explaining 14.6 % of the variance, canonical $R^2 = .24$, and the third explaining only 1 % of the variance, canonical $R^2 = .02$. A combination of the three discriminant functions significantly differentiated the four teams, Wilks’ $\Lambda = .26$, $\chi^2(9) = 68.95$, $p < .001$. A combination of discriminant function two and three also significantly differentiated the four teams, Wilks’ $\Lambda = .74$, $\chi^2(4) = 15.31$, $p < .01$. The third function alone did not significantly differentiate between the four teams, Wilks’ $\Lambda = .98$, $\chi^2(1) = 1.08$, $p > .05$. Correlations between the outcome variables and the three discriminant functions showed that mastery climate loaded low onto the first function ($r = -.17$), whilst perceived performance climate ($r = .40$) and effort/improvement subscale ($r = .46$) loaded moderate. Mastery climate ($r = .98$) and effort/improvement subscale ($r = .89$) loaded high onto the second function and performance climate ($r = -.36$) loaded moderately. Mastery climate ($r = .14$) and effort/improvement subscale ($r = .09$) revealed low loadings while performance climate ($r = .84$) revealed high loading onto the third function. As seen in Figure 1, the first discriminant function differentiated Team A and B from Team C and D. The second function discriminated Team A from the Team B, C and D. Predictions of team belonging was shown by the classification results. Knowledge on the outcome variables increased the ability to predict team belonging from 25 % if just guessing, to overall 64.3 %. Within teams a correct classification was made of 66.7 % of players in Team A, 82.4 % of players in Team B, 46.2 % of players in Team C and 56.1 % of players Team D.

Discussion

The present study sought to examine if differences between team sport coaches’ behavior patterns would be reflected in differences in the motivational climate between their teams. Knowledge on the objective situational cues affecting the motivational climate in team sports has in the literature been seen as an important step for the motivational climate research field (e.g., Amarose, 2007; Duda, 2002; Smith, Smoll & Cumming, 2009). The current study examined one of these objective situational cues, coaches’ behaviors, based on previous suggestions of the impact coaches may have on the motivational climate.

The MANOVA showed that the coaches’ behavior patterns were reflected in their
team’s perceived motivational climate. Having a coach with a passive behavioral pattern, overall not very engaged in interactions with players did reflect in a lower perceived mastery climate. In contrast, having a coach highly engaged in positive reinforcement and/or instructional behaviors was reflected by a higher perceived mastery climate. That higher levels of positive and instructional behaviors would be reflected by a higher perceived mastery climate was in line with the initial expectations and previous findings regarding associations between perceptions of coach behaviors and the motivational climate (e.g., Gardner, 1998; Smith et al., 2005). The finding that lack of encouraging and/or instructional behaviors from the coach was reflected by a lower perceived mastery climate was not expected. Previous research has highlighted the association between punitive behaviors in combination with lack of encouraging behaviors and a performance climate. The present findings also imply that a passive coach not engaged in punitive behaviors may have negative influences on the coach-created motivational climate. These negative implications of a passive coach was also reflected in performance climate scores where Team A, coached by a passive coach, had the highest scores. In addition to being passive, Coach A also engaged in the most frequent general communication during practices of the examined coaches. Previous research has found general communication negatively associated with coach evaluation (Smith et al., 1983) and a negative association between a performance-oriented climate and coach ratings (Balaguer et al., 2002). These previous findings may shed some light regarding why a passive

Figure 1. Discriminant functions differentiation of the four teams.
coach in the present study was negative for the motivational climate. General communication from coaches unequally distributed towards the players may very well lead to a perception of an unequal recognition, which is one aspect of the PMCSQ-2 performance dimension. Although singularity prohibited use of the unequal recognition scale in the MANOVA, Team A did have the highest mean score on the unequal recognition scale, thus supporting the general communication leads to unequal recognition hypothesis.

In line with expectations and previous findings was the reflection of Coach Bs behaviors on Team Bs performance climate scores. Coach B was the coach engaged in most punitive behaviors and Team B had the second highest scores on the performance climate scale, significantly higher than Team C and also higher than Team D, although not reaching statistical significance. Punitive behaviors are likely to direct the athletes’ focus towards performance outcomes and normative comparisons instead of focusing on working hard and skill development (Smith et al., 2005). As predicted by the achievement goal theory, focusing on performance outcomes and normative standards is likely to produce a performance-oriented climate.

Although the amount of feedback coaches need to provide for a particular effect is unknown, present results reveal an interesting link between coaches’ behaviors and the perceived motivational climate. When comparing the four coaches’ rate of behaviors, Coach B stands out as the most active coach, but Team Bs mastery climate scores do not significantly differ from Team C and D, whose coaches were classified as averagely active. However, when comparing scores on the effort/improvement subscale a significant difference was revealed in that Team B scored significantly higher on the effort/improvement subscale than the other three teams. Encouraging and instructional behaviors particularly tap the effort/improvement items in the PMCSQ-2. These findings are in line with the achievement goal theory, encouraging and instructional behaviors illustrates that the coach values hard work, focus on individual development and that effort leads to improvement over time. All of these aspects are considered as important in a mastery-oriented climate (e.g., Ames, 1992b; Roberts, Treasure & Conroy, 2007). These results do not indicate consequences of precise amounts of feedback, but still give an indication of the consequences of higher amounts of positive and instructional feedback for the motivational climate.

The discriminant analysis supported the MANOVA results and provided additional results of interest. The first function discriminating Team A and B from Team C and D and the second function differentiating Team A from Team B, C and D both strengthened the MANOVA findings. Predictions of team belonging showed varied results, but the variation is perceived as explainable. The percentage of correctly classified players in Team C and D might be perceived as low. However, when considering the combination of the two teams’ similarities in PMCSQ-2 scores (see Table 4), similarities in their coaches’ behaviors (see Table 2) and consulting Figure 1, these results make sense. These findings indicate that teams with coaches displaying similar behavioral patterns also displays similar perceived motivational
climate. From that perspective the low percentage of correct classifications may be a positive indication of the theoretical predictive ability of the achievement goal theory.

In summary, the results from the present study support previous findings as well as the achievement goal theory and indicate that the behavior patterns of the participating coaches were reflected in their teams’ motivational climate. The results also provided new findings worth further examination. First, that a passive coach may have negative impact on the perception of a mastery-oriented climate and as a consequence increase the perception of a performance-oriented climate. Previous findings have linked punitive behaviors in combination with lower levels of encouragement to a performance-oriented climate. A coach in team sports has the potential to create a positive climate for the athletes, but being passive may let other mechanisms take control of creating the motivational climate. An emphasis on results and outperforming others can in such situations easily be created in team sports where the competition is a central aspect. Second, a coach that is very active and highly engaged in encouraging and instructional behaviors can increase players’ perception of the climate as rewarding for effort and improvement. Interviews with successful coaches’ have shown that player effort is seen as a central aspect of motivation. From coaches’ point of view, players’ effort provided information about their level of motivation and based on these levels, coaches could modify their motivational strategies, especially during practice sessions, thus affecting the motivational climate (Hansen, Gilbert & Hamel, 2003). Both these findings need further investigation.

Limitations of the study and directions for future research
The small sample size in this study limits the ability to generalize these findings. Nevertheless, the results were in line with expectations and theoretical predictions, thus indicating a viable approach for future research on the topic. Future research should examine differences between age groups, sports and gender for a broader understanding of the influence of coaches’ behaviors on the motivational climate.

As always, observational studies increase the risk of behavior reactivity from the observed individuals. Data collection over a longer period of time would be an approach to avoid a potential reactivity and an interesting approach for assessing behavior-consistency over time. Recent research implies that coaches’ behavior consistency do have interpersonal consequences for the players attitudes towards the coach (Smith, Shoda, Cumming & Smoll, 2009). Coaches in the present study said that they were not affected by being observed, which is positive, but the risk of reactivity still remains.

The usage of the PMCSQ-2 was seen as important for tapping the motivational climate. Since no Swedish version exists, a translation procedure was necessary, but the Swedish version’s validity has not been assessed. This is a weakness, but the alpha values were in line with previous research.

Research on objective situational antecedents of the motivational climate is in its infancy and the research field has an interesting future. One of the biggest challenges is the measurement issue, which previously has limited this kind of research (Amarose, 2007). Within the physical education research, promising motivational
climate observational instruments have started to emerge (e.g., Morgan, Sproule, Weigand & Carpenter, 2005). An adaption of this type of instrument to the sport setting would be desirable. Although the CBAS include the majority of coaches’ behaviors, a more fine-tuned observational instrument would have the ability to assess nuances in coaches’ behaviors not assessed by the CBAS.

Research on the motivational climate is on the verge of taking the next step, moving from consequences to antecedents of different motivational climates. From an applied perspective, one of the most important research topics today is how sport psychologists can assist coaches in creating a mastery-oriented climate.

References


reasoning, and behaviour. Paper presented to the association for the advancement of applied sport psychology, Minneapolis, MN, USA.


