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“I don’t want to give them my brain for the day... and then take it back”: An examination of the coach-created motivational climate in adult adventure sports.

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**Title:** “I don’t want to give them my brain for the day... and then take it back”: An examination of the coach-created motivational climate in adult adventure sports.

## **Abstract**

In contrast to cross-sectional age trends of declining adult participation in sport, engagement in adventure sports is increasing among adults. The coach may have an important role to play in shaping the motivational climate to encourage and retain participants in adventure sport. The purpose of this study was to provide an in-depth examination of the coach-created motivational climate in non-competition focused adult adventure sport by adopting a multiple methods approach. The study was grounded in a multidimensional theoretical perspective that combines achievement goal theory (Nicholls, 1984; Ames, 1992) and self-determination theory (Deci & Ryan, 2000; Ryan & Deci, 2000). Questionnaires, interviews, and observations of coaching sessions were employed to assess coaches’ ( $N=6$ ), participants’ ( $N=25$ ), and observers’ perspectives on the empowering and disempowering nature and features of coaching sessions. Analysis of the data demonstrated consistent views that the coaches’ created a strongly empowering and only weakly disempowering climate. Insight was gained about why and how coaches created this climate as well as the challenges they experienced in maintaining an empowering climate for adults in adventure sport contexts. The place of structure, control, relatedness support and coaches’ philosophies is discussed.

**Keywords:** Coaching practice, achievement goal theory; self-determination theory; competence; autonomy; relatedness.

## Introduction

Adults' participation in physical activity affords numerous benefits such as improved social relationships and better psychological and physical health (Sport England, 2017; World Health Organisation, 2018) and yet, many adults do not meet physical activity guidelines and participation declines with age (Scottish Government, 2017; NHS Digital, 2017). Consistent with this overall trend, in the United Kingdom (UK), participation in many traditional or formal team sports is also declining (Sport England, 2015). In stark contrast, however, participation in activities in the outdoors has increased (Sport England, 2015). Of the total active population, 27.6% (8.9 million) is active in the outdoors and of the 2.5 million (28%) participants who are regularly active in the outdoors, 70% (1.7 million) are participating in Adventure Sports (e.g., kayaking, skiing, mountaineering, mountain biking, climbing). Although not all adventure sport participants receive coaching, coaches play a critical role in assisting participants to learn to undertake the activities (Collins & Collins, 2012) and therefore they support entry to and maintenance of participation in adventure sports. Taking a theoretically grounded approach and employing multiple methods, the current study examined participants', coaches', and observers' perceptions of coaching practice in non-competitive adult adventure sports, specifically exploring the coach-created motivational climate.

Adventure sports have been defined as sports that are non-competitive in origin, take place in complex and dynamic environments, where awareness of risk is critical, individualised rules are 'policed' by the participants (culturally formed and led) and there is challenge by choice (Collins & Collins, 2012; Berry, Lomax & Hodgson, 2015). Adventure sport participants' motivation goes beyond simple excitement or 'thrill seeking' to feeling connected within the natural environment and a focus on achievement based on their own progress and personal mastery (i.e., task goal orientation) (Collins & Collins, 2012; Kerr & Mackenzie, 2012; O'Connell, 2010).

Research examining adult participants' sport experiences of coaching has focused on Masters sport which involves adults typically over the age of 35 years who train regularly in order to compete in rule-based sport and often formally register with organisations, clubs, or events (Young, 2011). Research demonstrates that coaches are influential figures in athletes' sport experiences. Adults recognize benefits from working with a coach such as improved performance, self-efficacy, and

health outcomes (Callary, Rathwell, & Young, 2015; Ferrari, Bloom, Gilbert, & Caron, 2016).

Working with a coach is associated with more self-determined motives for participation and lower ego-orientation (Medic, Young, Starkes, & Weir, 2012) and coaches' support and encouragement is associated with participants' commitment (Santi, Bruton, Pietrantonio & Mellalieu, 2014).

Furthermore, with regards to coaching practices, research in Masters sport, indicates that athletes prefer coaches who are friendly and care about them, consider the athletes' perspectives and desires, and provide planned and challenging sessions, constructive feedback to help them improve performance, and information to support competition performance (Callary et al., 2015; MacLellan, Callary, & Young, 2018). To date, only two studies have examined coaches' perspectives of working with Masters athletes (Callary, Rathwell, & Young, 2017; MacLellan, Young, & Callary, 2019). Both studies found that coaches reported they provide athletes with a rationale for various learning activities, understand and support athletes' self-direction in training, acknowledge athletes' improved performance, and attempt to relate well with the athletes. Callary et al. (2017) also found that for some coaches some actions are seen as risky and problematic such as 'giving' control to the athletes.

The research examining coaching in adults' sport provides valuable insight into the coaching preferences of Masters athletes and the influence and practices of coaches working with these adult athletes. To date, however, research examining coaches' perspectives is limited and it has examined coaching from an andragogical perspective (e.g., Callary, Rathwell, & Young, 2018; MacLellan, Callary, & Young, 2019).

To further develop our understanding of adult sport participants' experiences and begin to explain why coaches' actions influence participants, research that draws on theory to examine participants' and coaches' perspectives at the same time is needed. Adopting a theoretically-grounded approach to our examination of coaching in adult adventure sports, the current study focused on the coach-created social psychological environment or 'motivational climate' which is a prominent concept in two theories: Achievement Goal Theory (AGT) (Ames, 1992, Nicholls, 1984) and Self-Determination Theory (SDT) (Deci & Ryan, 2000; Ryan & Deci, 2000).

*The motivational climate: Two theoretical perspectives or a multidimensional perspective*

The motivational climate was defined as the characteristics of the social psychological environment that convey information about what is, or should be, considered important in that context and captures the characteristics of the environment that influence learning and performing (Ames, 1992). According to AGT, coaches who foster a task-involving climate focus participants on self-referenced effort and improvement, cooperation and role importance. In contrast, coaches who focus participants on their ability in comparison to others and emphasize the importance of superiority, outperforming others, and rivalry foster an ego-involving climate (Ames, 1992, Nicholls, 1984). According to SDT, coaches who foster an autonomy-supportive motivational climate support the satisfaction of participants' basic psychological needs (autonomy, competence, relatedness) (Deci & Ryan, 2000; Ryan & Deci, 2000; Mageau & Vallerand, 2003). In contrast, coaches who create a controlling motivational climate thwart need satisfaction (Bartholomew, Ntoumanis, & Thøgersen-Ntoumani, 2009). An important contribution from AGT which extends SDT is that rather than considering the support for competence per se, AGT proposes that supporting task-focused competence is more adaptive than an emphasis on ego-focused competence. To date, researchers examining the motivational climate have provided valuable insight into participants' perceptions and the outcomes for participants of these differing climates. This significant body of work generally supports the tenets of AGT and SDT, in particular that task-involving and autonomy-supportive climates are associated with adaptive motivational outcomes and ego-involving and controlling climates are associated with maladaptive outcomes for participants (Harwood, Keegan, Smith, & Raine, 2015; Occhino, Mallett, Rynne, & Carlisle, 2014).

Building on the research from AGT and SDT, a number of researchers have proposed that considering the climate dimensions from each theory (i.e., task-involving, ego-involving, autonomy-supportive, controlling, relatedness support, and relatedness thwarting) together, rather than in isolation, provides a fuller understanding of coaches' actions and the influence on participants' motivation and well-being (Allen & Hodge, 2006; Appleton & Duda, 2016; Duda, 2013; Keegan, Spray, Harwood & Lavalley, 2014; Mallett & Hanrahan, 2004; Smith et al., 2015). Research has demonstrated that considering the climate dimensions together is useful, particularly when examining the mechanisms (i.e., basic psychological needs satisfaction or thwarting) in the relationships between coaches' actions and participants' outcomes. Furthermore, this research indicates that the climate dimensions are not

redundant when included together, rather they explain unique variance and demonstrate only modest correlations (e.g., Quested & Duda, 2010; Reinboth, Duda, & Ntoumanis, 2004). Duda (2013) adopted a multiple theory approach to examining the coach-created motivational climate proposing that the climate can be more or less empowering and disempowering. An empowering climate is task-involving, autonomy-supportive and socially-supportive; and a disempowering climate is ego-involving and controlling. Furthermore, along with colleagues Duda proposed the coaching behaviours associated with an empowering or disempowering motivational climate (Appleton, Ntoumanis, Quested, Viladrich, & Duda, 2016; Smith et al., 2015). This empowering conceptualisation of coaching has much in common with the International Sport Coaching Framework (ICCE, 2013) which promotes an athlete-centred approach to coaching.

*Participants' perceptions of the motivational climate: There is more to understand*

A considerable body of research has demonstrated the maladaptive implications of ego-involving and controlling climates and the adaptive implications of task-involving and autonomy-supportive climates (e.g., Adie, Duda & Ntoumanis, 2008; Harwood et al., 2015; Occhino et al., 2014; Smith et al., 2016). This research is not without its limitations and there remain areas that are less well understood (Harwood, et al., 2015; Occhino et al., 2014). Harwood et al.'s (2015) systematic review found that most research examined the perceptions of school or college participants with almost 80% of samples' mean ages under 20 years and only three studies reporting a sample mean age over 25 years. Furthermore, Harwood et al. (2015) also found that two-thirds of the studies were conducted in either PE or team sports with relatively few studies (12.5%) examining individual sports. In addition, they did not specifically examine the extent to which the studies focused on competition-based compared with non-competition focused sports. It is reasonable, however, to suggest that all the team sports samples as well as at least some of the individual sports samples (e.g., track and field athletes and Winter Olympics athletes) had a competitive element. We argue here that adventure sports are typically individual rather than team sports and are often not focused on competing against others (Collins & Collins, 2012). Therefore, adventure sports provide a useful context to extend our understanding of the motivational climate in adult, individual non-competitive settings.

Much of the research examining the motivational climate has focused on competition-oriented sport and been limited to the perceptions of participants, irrespective of age, which can vary substantially even when participants have the same coach (Harwood et al., 2015; MacLellan et al., 2018). Although still within competition-focused sport, the work of Smith and colleagues (e.g., Smith et al., 2015; 2016) in youth sport has begun to address this limitation by examining the motivational climate from multiple perspectives including coaches and observers as well as participants. In these large-scale quantitative studies, however, there is little opportunity to develop in depth understanding of the coaches' perspective, in particular, why they behave as they do and how they intend to create the motivational climate. In addition, information on the background of the coaches is limited. Given the coaching context (i.e., youth sports), these coaches are likely to be amateur, volunteer, part-time, and possibly unqualified, at least to any level above introductory coaching. As a result there is a gap in our understanding of the motivational climate experienced by adult participants in non-competitive individual sports and the intentions and behaviours of those who foster the motivational climate, in particular expert coaches (i.e., experienced, qualified). Research that adopts alternative methodologies that enable 'fine grained analysis' of how the climate is created through behaviours and in certain situations or contexts is warranted to extend existing knowledge upon which recommendations are made to coaches (Harwood et al., 2015; Occhino et al., 2014). Furthermore, research that includes in-depth qualitative data collection techniques such as interviews with coaches provides an opportunity to understand better the coaches' perspective (Occhino et al., 2014; Partington & Cushion, 2013).

#### *Adventure sports coaching and the motivational climate*

Adventure sports coaches work in a range of environments and roles from self-employed, running their own businesses to working for established outdoor sport organizations. They require regular professional development and work within regulated professional standards. Effective coaches value positive adventurous experiences, individualise coaching to meet participants' needs (including psychological needs) and focus on fostering participants' intrinsic motivation, decision-making, and independent performance in the environment (Berry et al., 2015; Collins & Collins, 2016; Cooper & Allen, 2018; Lorimer & Holland-Smith, 2012). However, little is known about the motivational climate created by adventure sports coaches. Whilst research suggests coaches' values may be

consistent with an empowering motivational climate, whether this translates into empowering coaching strategies and an empowering motivational climate perceived by participants has not been examined. Furthermore, there is still potential for disempowering coaching through practices that are ego-involving (e.g., emphasizing comparative ability within the group or the importance of ‘firsts’ – first ascent), controlling (e.g., coach-led to minimize risk and ensure safety of participants), and relatedness thwarting (e.g., limited time to ‘get to know’ participants due to short, episodic courses). Therefore, the purpose of this study was to examine the motivational climate fostered by expert adventure sport coaches, specifically to 1) examine adult participants’ perceptions of the motivational climate; 2) determine the coaching behaviours employed to create the climate; and 3) examine adventure sport coaches’ beliefs, values and intended motivational climate. This research will assist those responsible for adult sport to better understand the motivational climate and the potential it has to contribute to initiating and sustaining participation and promoting optimal psychological functioning of adult participants.

## **Method**

### *Participants*

Adventure sport coaches ( $N=6$ ) ( $M$  age=36.7 years,  $SD=8.7$  years) were purposefully sampled and agreed to participate in the study. They were selected because they coached adults performing in a non-competitive environment, were considered expert in their practice, and had specific expertise in a different adventure sport (winter mountaineering, off-piste ski touring, white water kayaking, rock climbing, mountain biking, canoeing). The criteria for expertise were similar to those employed by researchers in adventure sports coaching (Collins & Collins, 2016; Cooper & Allen, 2018) and other sports (Abraham, Collins, & Martindale, 2006; Côté, Salmela, Trudel, Baria & Russell, 1995; Nash, Martindale, Collins & Martindale, 2012). Specifically, expertise was based on: minimum of 10 years coaching, highest level of National Governing Body (NGB) coaching qualification, academic qualification, published adventure sport-specific work (e.g., Technical DVDs, Magazine articles, Technical Books), high level of personal performance (e.g., international expedition experience), active engagement in adventure sport coaching and coach education delivery, and NGB recommendation (Table 1).



Adult adventure sports participants who were being coached by the coaches ( $N=25$ ; winter mountaineering ( $n=4$ ), off-piste ski touring ( $n=5$ ), water kayaking ( $n=4$ ), rock climbing ( $n=2$ ), mountain biking ( $n=8$ ), white canoeing ( $n=2$ )) agreed to participate in the study. They were participating in organised coaching sessions lasting between two hours and a full day. These sessions were generally part of a two to five day skill development course the participants had paid to be part of, a common form of coaching in adventure sports. Therefore, the participants had some experience with the sport and were intermediate level rather than novice performers. None had met or worked with the coaches prior to the start of their course.

The authors were the observers for the study. Both have expertise in the motivational theory guiding the study and are experienced coaches. The first author is also an expert adventure sports coach. Therefore, between them, the observers had appropriate understanding of the theory, coaching, and context to inform analysis of the data collected.

### *Study Design*

Motivational climate research has typically focused on participants' self-reported perceptions rather than actual coaching behaviours employed (see Webster et al., 2013; Smith et al., 2015; Smith et al., 2016 for exceptions). To address this limitation, and similar to Smith et al. (2015), we employed multiple research methods, gathering the perceptions of the adventure sports participants, coaches and independent observers. We also conducted interviews with the coaches to explore their perceptions of and explanations for their behaviours and the motivational climate. Grounded in an interpretive paradigm (Hodge et al., 2014; Potrac, Jones & Nelson, 2014), where the aims are to illuminate and understand human experience, our approach purposefully selected expert coaches and gathered data from multiple sources that enabled us to triangulate our findings and provide a more comprehensive understanding of the motivational climate.

### *Procedure*

After ethical approval for the study was obtained from the authors' institution, the coaches were identified, invited, and agreed to participate in the study. Prior to the observation, the first author met with the coaches to explain the purpose and process of study and answer any questions. Potential coaching sessions suitable for the study were identified (i.e., sessions coaching adult participants). Prior

to the start of each session the first author met with the adults in the coach's group to explain the study, answer any questions and invite them to participate in the study. They all agreed to participate. Following recruitment, the first author video and audio recorded a coaching session led by each coach involving the participants. The coaching sessions lasted between 50 – 90 minutes. The coach wore a small clip-on microphone and hidden voice recorder. The observer videoed from an unobtrusive position away from the coaching environment to minimize the effect of the observer/camera on the coaches' behaviours and experiences of participants (Smith et al., 2015; Webster et al., 2013). The environments and terrain in which the coaching sessions took place (e.g., rivers, snow covered mountain cf. static football pitch) present significant challenges for observation and recording of authentic coaching sessions. Performance expertise and familiarity with the contexts enabled the first author to safely negotiate these potentially dangerous environments and ensure quality recordings of coaching sessions *in situ*. For example, in order to stay close enough to record the off-piste ski-touring coaching session, the first author skied without the aid of poles and held the video camera in one hand as he followed the coach and participants as they skied their way down the mountain. After the session, the participants and coaches completed a questionnaire to gather their perceptions of the motivational climate. Finally, the coaches were interviewed to explore their views on how and why they coached as they did and the impact they perceived their coaching interactions had on participants. Prior to the interview, a pilot interview took place with a coach of similar expertise to those in the study (Purdy, 2014; Gray & Collins, 2016). Only slight amendments were made, primarily regarding the probes. Interviews lasted approximately 20 minutes, were recorded and then transcribed verbatim.

#### *Data Collection*

*Observed motivational climate.* Three 10-minute clips were selected from the total recording of each coaching session. These were purposefully chosen to ensure there was interaction between the coach and participants during the clips and the clips represented the start, middle and end of the session (Smith et al., 2015; Smith et al., 2016; Webster et al., 2013; Collins & Collins, 2016). The clips were analyzed and coded using the Multidimensional Motivational Climate Observation System (MMCOS) (Smith et al., 2015). The MMCOS has two higher-order factors: empowering and disempowering. There are four environmental dimensions that promote an empowering climate (autonomy-supportive, task-involving,

relatedness-supportive and structured), and three environmental dimensions that promote a disempowering climate (controlling, ego-involving and relatedness-thwarting). For each environmental dimension there are three to six lower order behaviours, giving a total of 34 coaching behaviours that promote either an empowering or disempowering motivational climate. Initial research has supported the validity and reliability of the MMCOS in youth team sport (Smith et al., 2015; Smith et al., 2016). All the coaching clips were independently coded by the authors. Coding followed the recommendations of Smith et al. (2015). Every time a lower order behaviour was seen it was noted, this helped to provide a potency rating for the seven environmental dimensions (0 = Not at all; 1 = Weak emphasis; 2 = Moderate emphasis; 3 = Strong emphasis). When all three clips had been coded there was a possible score of zero to nine for each of the seven environmental dimensions. The final potency rating for each environmental dimension was determined from this (0 = Not at all; 1-3 = Weak emphasis; 4-6 = Moderate emphasis; 7-9 = Strong emphasis). Following coding, inter-rater reliability was assessed through calculation of interclass correlations (ICC) for the environmental dimensions and higher-order overall climate dimensions (Smith et al., 2015). The correlations ranged between .65 and .97 (Table 3). The ratings were, then, compared, discussed and potency ratings for the motivational climate dimensions for each coach were agreed. Following this analysis, overall ratings for higher-order factors of empowering and disempowering climates were discussed and agreed (Smith et al., 2015).

*Adventure sports participants' perceptions of the motivational climate.* To gather participants' perceptions of the motivational climate created by their coach they completed the coach-created Empowering and Disempowering Motivational Climate Questionnaire (EDMCQ-C) (Appleton et al., 2016). The EDMCQ-C contains 34 questions, including nine task-involving, five autonomy-supportive and three socially-supportive items capturing an empowering climate; and seven ego-involving and 10 controlling items comprising a disempowering climate. For the purpose of this research some items were modified to be more relevant for adventure sport coaching. For example, the original item: 'My coach really appreciated players as people, not just athletes', was modified to read: 'My coach really appreciated learners as people, not just clients'. The term learner was used rather than athlete or participant because in the adventure sports context those undertaking skill development would view themselves as 'learning', as opposed to being an athlete. Participants read the stem 'Thinking back to

when you were being coached today...' and responded to each item on a 5-point Likert scale (1 = Strongly disagree to 5 = Strongly agree). Initial evidence for the reliability and validity of the EDMCQ-C has been provided in previous research (Appleton et al., 2016; Smith et al., 2016). In the current study, the reliability for the subscales were above .70 (Cronbach's alpha, Nunnally, & Bernstein, 1994) with the exception of autonomy-support (Table 2), a finding consistent with Appleton et al. (2016). This subscale requires caution in the interpretation.

*Adventure sport coaches' perceptions of the motivational climate.* Appleton et al.'s (2016) EDMCQ-C was also used to capture the coaches' perceptions of the empowering/disempowering climate they created. Similar to Smith et al. (2015), the items were modified to ensure the items were coach orientated and relevant to the adventure sports coaching domain. For example, the original item: 'My coach lets us know that all the players are part of the team's success', was modified to read: 'I let my learners know that they are all part of the group's success'. Coaches read the stem 'Reflecting back to when you were working with the group today...' and responded to each item on a 5-point Likert scale. Due to the small number of coaches, the reliability of the coaches' questionnaire subscales were not calculated, however, evidence of reliability of this scale has been demonstrated (Appleton et al., 2016). One-to-one semi-structured interviews were conducted to obtain insight into coaches' perspectives on why they coach as they do and the impact they perceive their interactions are having. The interviews contained pre-determined questions used as a guide with additional probes for further investigation. Questions explored coaches' understanding of the concept of motivational climate, consideration of the climate in their coaching, perceptions of the association with values and beliefs, influences on and adaptations to their coaching, and appropriateness for participants' needs. For example, the question: what do you understand by the term 'motivational climate'? was used to explore coaches' knowledge of the concept and establish an agreed understanding as a basis for following questions. Other example questions included: how would you describe the climate you create? How do you do this? What situations (if any) require different types of motivational climates? How do you adapt what you do? This semi-structured approach ensured there was flexibility to explore additional areas emerging through discussion (Patton, 2002; Purdy, 2014).

## *Data Analysis*

For each coach, the means and standard deviations were calculated for the participants' and coaches' perceptions of the motivational climate dimensions, the empowering and disempowering climate (Table 2), and potency ratings (Table 3). Overall means and standard deviations were then calculated for participants' and coaches' perceptions and observers' ratings for each dimension and empowering and disempowering climate overall (Table 2 & 3). A cross interview analysis of the interview transcriptions was conducted. Coaches' responses to questions were grouped together, common themes established, and key similarities and differences identified (Patton, 2002). Following collation of the multiple data sources, detailed analysis was conducted of the participants', coaches' and observers' reports of each environmental dimension and the coaches' understanding and explanations for how and why they created the motivational climate. An inductive approach to the analysis was adopted allowing themes to be developed from the data. However, the theoretical concepts underpinning the questionnaires and observation tool also provided sensitising concepts for the analysis (Patton, 2002). This enabled the researchers to examine how the motivational climate is manifest in adventure sport coaching (Patton, 2002). Independently the researchers moved between the sources of data using a comparative approach and analytical memos to establish commonalities and differences in the nature of the motivational climate (Patton, 2002). The researchers, then, discussed their interpretations and meaning of the data, identifying areas of agreement as well as differences. Where differences were noted, they returned to the data, including revisiting video recordings, discussing their views in turn and reached agreement on the meaning of the data and the lower and higher order themes. This analysis process ensured not only triangulation of data by examining views from multiple sources (Smith et al., 2016; Patton, 2002) it also contributed to the trustworthiness of the findings (Cresswell & Miller, 2000; Patton, 2002).

## **Results**

The analysis of the data from multiple sources (observers, participants, coaches) and methods (observation, questionnaire, interview) resulted in six lower order themes that were organized into two high order themes: empowering motivational climate for adults; dynamic motivational climate. These themes are described below along with illustrative evidence. When interpreting the mean scores for

participants' and coaches' perceptions of the motivational climate, it is important to note that these can vary from one (strongly disagree) to five (strongly agree). Observers' mean potency rating scores for the overall motivational climate can vary from zero (not at all) to three (strong) and for the dimensions of the climate can vary from zero (not at all) to nine (strong).

#### *Empowering motivational climate for adults*

This theme comprised the evidence indicating that the adventure sport coaches created an empowering motivational climate as well as how the climate was created and why. Overall, the perceptions of the coaches, participants, and observers were consistent, indicating that the coaches created an empowering motivational climate with very little emphasis on disempowering dimensions. The coaches' and adult participants' perceptions were similar, with the coaches' perceptions compared with the participants' perceptions (where 5 reflects 'strong agreement') generally suggesting a slightly less empowering ( $M=4.12$ ,  $SD=0.22$  cf.  $M=4.30$ ,  $SD=0.35$ ) and slightly more disempowering climate ( $M=1.81$ ,  $SD=0.23$  cf.  $M=1.22$ ,  $SD=0.35$ ). Consistent with both coaches and participants, the observers' ratings (where 3 indicates strong potency and 0 indicates no potency) indicated strong empowerment ( $M=2.67$ ,  $SD=0.52$ ) and almost non-existent disempowerment ( $M=0.33$ ,  $SD=0.52$ ). This theme included three lower order themes: founded in coaches' beliefs and translated into action; intentional but tacit empowering climate; and a place for structure.

*Founded in coaches' beliefs and translated into action.* The coaches' beliefs and values about coaching reflected an empowering approach to coaching such as: "what works best for the learner, kind of empowering them" (C4); autonomy supportive: "I'm encouraging people to choose, to make choices... I think they should have control of outcomes, because it's their outcomes that they continue to explore and develop. The end result has to be owned by them" (C6); and relatedness supportive: "to create an atmosphere that is supportive, letting students realize you're there for them, trying to help them discover reasons why they want to actually be in that learning environment." (C3) Furthermore, the coaches' questionnaire responses indicated they believed they were engaged in autonomy-supportive ( $M=4.30$ ,  $SD=0.21$ ), social supportive ( $M=4.17$ ,  $SD=0.18$ ), and task-involving ( $M=3.89$ ,  $SD=0.45$ ) behaviours in their coaching. Therefore, their intentions were to act in accordance with their empowering beliefs and values and they thought they were doing so.

Participants' perceptions and observers' ratings indicated that the coaches were translating these empowering beliefs into behaviours that fostered an empowering motivational climate. Participants' mean scores were high on all three empowering environment dimensions: socially-supportive ( $M=4.41$ ,  $SD=0.50$ ), task-involving ( $M=4.28$ ,  $SD=0.50$ ), and autonomy-supportive ( $M=4.22$ ,  $SD=0.38$ ) and the observers' ratings indicated strong potency for the empowering dimensions; autonomy support ( $M=6.83$ ,  $SD=0.52$ ), relatedness support ( $M=6.67$ ,  $SD=1.03$ ) and task-involvement ( $M=6.00$ ,  $SD=1.03$ ). Based on the observation data, the empowering behaviours that occurred most often included providing opportunity for participants' input and rationales for tasks (autonomy support), adopting a warm communication style and ensuring participants are included in activities (relatedness support), providing guidance through activities (structure) and emphasizing task-focused competence feedback (task-involving) (Table 4). The consistency of findings across multiple sources and methods suggested that because of the coaches' beliefs about coaching and their coaching experience, they were able to translate these beliefs into observably empowering actions and, importantly, these actions were recognised as empowering by participants.

*Intentional but tacit empowering climate.* Despite engaging in coaching behaviours considered empowering, the coaches' deeply held beliefs and experience enabled them to almost 'forget' about the motivational climate aspect of their coaching as it had become second nature, ingrained in their practice. It was only when questioned about what they did and why, that the empowering nature of their coach-created motivational climate surfaced and became explicit to them. This resulted in the juxtaposition of the intentional yet tacit nature of the motivational climate these coaches created. On one side, from the interviews, it was clear that the coaches considered the environment they created in their coaching. C1 commented: "They will have their own slightly different motivation, and I try to create an environment [that is suitable] for them." Importantly, not only did the coaches consider the climate, but they intentionally employed coaching strategies that resulted in creation of an empowering motivational climate. C4 commented on the importance of developing participants who were able to make decisions themselves rather than rely on the coach: "What I don't want is to give them my brain for the day and then take it back at the end of the day... I need them to, in a way, sort of understand the process we're going through... where we're going to... these are maybe our guidelines that we're working to. And you

work out what best works for you within that... Rather than being told exactly how to do it.” However, the climate was also tacit in the coaches’ actions, i.e., part of how they generally went about coaching as opposed to explicitly planned with the climate in mind. C5 commented: “I’m not sure I actively consider what I’m doing in terms of motivational climate... Yes, I consider it, but I don’t really see how I could not consider it... It’s implicit, that’s what I’ll be trying to achieve.” C6 commented how the motivational climate wasn’t “in my mind actively, but in response to what appears to be going on, as it is happening with the students all the time.”

*A place for structure.* Structure is not included in the questionnaires developed to assess the empowering/disempowering motivational climate. From the observations, however, the structure of sessions was the strongest dimension of the coaches’ empowering motivational climate ( $M=8.33$ ,  $SD=0.82$ ). Specific behaviours, that were commonly observed included providing guidance through activities and providing instruction and organization (Table 4). Structure may appear at odds with support for autonomy and empowerment through a sense of constraining individuals’ freedom. In the interviews, however, the coaches recognized that appropriate use of structure could facilitate autonomy and empower participants. Coach 5 gave an example of providing ‘tools’ (ideas, information) to help participants to explore and develop: “I really like giving people tools and saying go play with that... I like to do that as quickly as possible to see people’s faces when they work it out for themselves, that smile on their faces.” The coaches’ recognized that structure could also foster participants’ confidence and actual competence, both of which were necessary to enable participants to continue their involvement in the sport with more independence. Coach 3’s description of his work with a paddler indicates a structured process of development of competence that empowers future engagement:

...in conversation we managed to get to the point where after the first repetition, which he didn’t perform at all well, we managed to look at the strokes that he used and create a little model. Which meant that he could navigate to the point he needed to be to deliver, what was quite an advanced skill... and he delivered very well. So, I guess there are a couple of needs met there, the satisfaction and successful outcome of the actual skill was attained, but it was attained because we’d actually given a bit of information on how to read what the water was doing and he had more information to work off. He can take that away... that helps in other similar situations.



424 *Dynamic motivational climate*

425 This theme comprised the evidence indicating that the motivational climate was not static but rather  
426 change and adaptation was often required dependent on contextual factors. C2 commented: “I felt the  
427 motivational climate was quite dynamic through the two days, in the sense that it changed.” An example  
428 of this was a gradual ‘handing over of control’ to participants evident in the pattern of observations,  
429 where four of the coaches exhibited controlling behaviours (albeit weak potency) early in the sessions.  
430 Towards the end of the session there was no evidence of controlling behaviours from any of the coaches  
431 (Table 3). C2 reinforced this pattern commenting: “I started with a lot of control and then just gradually  
432 eased back over the two days.” Another example, was evident in Coach 5’s measured approach to who  
433 was ‘leading’ in sessions, “I want a continuum with the aim being to get to the end of the process so to  
434 pass over control to them. Not that you can always do that straight away.” Other examples of the  
435 dynamic nature of the climate were captured in the three lower order themes: challenges to an  
436 empowering climate; a place for control; buffering control with relatedness support.

437 *Challenges to an empowering climate.* All the coaches identified challenges creating and maintaining  
438 their preferred (empowering) motivational climate. These included feeling pressured, participants’  
439 needs/wants/ability, dynamic physical environment and weather conditions, and safety concerns. With  
440 regards to pressure, C1 explained: “I try to take a lot less control, give a lot more of the decision making  
441 to the students, but I recognise very quickly that when I feel under a lot of pressure I would grab the  
442 control and keep it.” A specific situation where coaches felt pressured and as a result, felt challenged in  
443 their ability to create an empowering motivational climate was when they delivered National Governing  
444 Body (NGB) award courses. The coaches felt that on these courses the participants’ motivation, the  
445 defined syllabus and time constraints negatively affected the empowering nature of the motivational  
446 climate they were able to create. C3 commented: “There is a time constraint put on you, you try as much  
447 as you can to allow choices to exist, but really you're constantly steering and directing things to just get  
448 through content in the time allowed.” C4 commented: “you almost don’t have time to build that  
449 relationship.” Physical environmental conditions and their dynamic nature such as the quality and levels  
450 of snow or water and/or the weather also led coaches to change their coaching behaviours and resultant  
451 climate. C1 identified that “I was furious with myself, I had turned into a nag. Part of it was because of

the physical nature of the environment, and the weather, just having to keep things moving.” The feature of the climate that changed most often was the controlling dimension.

*A place for control.* It was clear that the coaches felt there was a place for control in what they did, C1 commented: “I need to step in and take control here, because of the risk and hazards involved.” Participants’ and coaches’ perceived a weak disempowering climate ( $M=1.44$ ,  $SD=0.35$  and  $M=1.81$ ,  $SD=0.23$  respectively) which was corroborated in the observation ( $M=0.33$ ,  $SD=0.52$ ). However, some disempowering behaviours were still evident. For example, the participants’ and coaches’ perceptions of controlling behaviours, a dimension of a disempowering climate, were low but still reported by them ( $M=1.50$ ,  $SD=0.35$ ;  $M=1.78$ ,  $SD=0.34$  respectively). The controlling dimension was observed most often (Table 3), albeit with weak emphasis ( $M=1.33$ ,  $SD=0.82$ ). In fact, controlling behaviours were weak or non-existent for three of the coaches and only a moderate emphasis for the other three coaches (Table 3). Concerns over participants’ safety was a primary reason coaches adopted more control. These concerns were often a result of consideration of participants’ ability in relation to the physical environment in which they were performing as well as changes in weather and conditions. For example, C4 commented: “So if there is higher risk I might give them a little bit less control, but if they have the ability to understand that risk they may get more control.” C5 commented: “I end up being in control of the session for safety... The weather might change and then we need to get on with it to keep them safe.”

*Buffering control with relatedness support.* Despite some controlling behaviours the perceptions of the participants was that an empowering climate was maintained. An explanation for this somewhat contradictory finding is that it was clear the coaches believed that when control was exerted the participants’ well-being was central to this decision-making. This suggested a demonstration of care for participants which is a feature of relatedness support. C5 commented:

“People might be feeling a little bit nervous [then] it might be more controlled, but I try not to be authoritative... a couple of folks struggled with confidence a lot and they wanted a bit more of a ‘hand on their shoulder’... “it’s okay guys, I’ve got the situation under control.”

Another feature of relatedness support that may have also contributed was the development of a sense of connection or relationship between coaches and participants. C2 commented: “You’ve got to

establish that initial kind of connection with someone.” C6 articulated the connection with control: “a sense of partnership, I think that’s kind of central to me... I think there’s a partnership and it is finding that balance of steer.” Furthermore, participants recognised this relatedness support, rating it highly, second only to structure, in the climate dimensions ( $M=4.41$ ,  $SD=0.50$ ). Observed relatedness support was strong for two coaches and moderate for the other four coaches whilst relatedness thwarting was non-existent for four coaches and weak for the other two coaches.

## **Discussion**

The purpose of this study was to explore the coaching practices of coaches working in non-competitive adult sport, specifically to examine the motivational climate created by expert adventure sport coaches and perceived by adult participants. In our detailed analysis of the motivational climate, we sought to determine the extent to which the climate was empowering/disempowering and how and why the coaches created the climate. The study’s findings contribute to our understanding of how coaches work with adult participants in non-competitive adventure sport settings by providing insight into: 1) adult sport participants’ perceptions of the motivational climate; 2) the motivational climate in adventure sports, a growing adult physical activity context; 3) the climate created by expert coaches and how and why they create it; 4) the challenges coaches’ experience fostering an empowering motivational climate. This study adds to the research on coaching adult sport participants, which to date has focused primarily on describing perspectives of athletes, specifically those involved in competitive sport (i.e., Masters athletes) (e.g., Callary et al., 2015; Ferrari et al., 2017; Medic et al., 2012). Although Callary et al., (2017) and MacLellan et al. (2019) explored coaches’ perspectives, our study is the first to examine coaches’ and athletes’ perspectives within the same study, therefore enabling direct comparison of stakeholders’ perceptions. It also adds to the research by adopting a theoretically grounded approach through our focus on the motivational climate. In doing so, the study also extends research on the motivational climate, which has typically focused on youth and collegiate team sports (Appleton & Duda, 2016; Harwood et al., 2015; Occhino et al., 2014; Smith et al., 2015; 2016), by examining the motivational climate experienced by adult participants in individual non-competitive sports, in particular adventure sport.

Our findings indicate that the motivational climate created by the expert adventure sport coaches and perceived by adult participants was empowering and not disempowering. These findings are consistent with findings from observational studies in youth sport that have found coaches typically create a more empowering and less disempowering climate (Smith et al., 2015; 2016). Furthermore, an empowering motivational climate has much in common with the andragogic approach MacLellan et al. (2019) identified in their interview-based case study of a coach of Masters athletes. An empowering (autonomy supportive, task involved, socially supportive) climate has been associated with adaptive motivational and affective outcomes for sports participants, including adults (Cronin, Walsh, Quayle, Whittaker, & Whitehead, 2018). Whilst it was not the purpose of this study to assess outcomes associated with particular motivational climates, the combination of our findings with those from existing research suggest adventure sport participation may also be associated with these adaptive outcomes for adult participants.

Two important features of our findings were: 1) the provision of *both* structure and autonomy; and 2) role of relatedness support. The coaches in the current study provided support for autonomy (e.g., opportunities for input, rationale for tasks), a task-involved emphasis (e.g., individualized improvement competence feedback), and structure (e.g., guidance through activities) within a relationship that supported relatedness (e.g., warm communication style, ensuring participants are included in activities). According to Smith et al. (2015), “structure refers to the instructions, organization and guidance provided by the significant other (e.g., the coach) that informs his or her athletes about how to achieve success and meet the objectives of the activity at hand” (p.6). Used together, structure and autonomy enabled coaches to assist participants to improve their actual competence, supporting competence need satisfaction, through actively engaging participants in the learning process (autonomy supportive). This approach is consistent with research in education that has demonstrated teachers’ provision of *both* autonomy support and clear expectations (i.e., structure for competence support) were related to adaptive motivational outcomes for students (Vansteenkiste et al., 2012). There are also similarities with research examining coaching in Masters sport, where Callary et al. (2017) found that coaches reported explaining why athletes were engaging in training activities, encouraging self-direction, and individualising learning strategies and activities (Callary et

al., 2017). Furthermore, athletes preferred coaches who considered the athletes' perspectives and desires and provided training sessions that were planned, challenging and included constructive feedback to help them improve performance (Callary et al., 2015; MacLellan, Callary, & Young, 2018).

Autonomy and competence support also occurred within a deliberately fostered relationship between coach and participants that demonstrated care and genuine interest in participants. Research in education has demonstrated that teachers' support of students' sense of relatedness is associated with students' intrinsic motivation (Sparks, Dimmock, Whipp, Lonsdale, & Jackson, 2015). In adult sport, Cronin et al. (2018) found that coaches' autonomy support balanced with some direction within a caring relationship was important to support women's return to netball after some time away from the sport. Furthermore, findings in Masters sport suggests coaches' endeavor to relate well to athletes and athletes prefer coaches who are friendly and care about them (Callary et al., 2015; 2017; MacLellan et al., 2018). The actions of the coaches in our study, similar to those in research on adult sport (Callary et al., 2015; 2017; Cronin et al., 2018; MacLellan et al., 2018; 2019), were likely to satisfy participants' psychological needs of autonomy, competence, and relatedness which SDT predicts will lead to intrinsic motivation and enhanced well-being (Ryan & Deci, 2000; Mageau & Vallerand, 2003). Furthermore, consistent with SDT (Deci & Ryan, 2000; Ryan & Deci, 2000) and Mageau and Vallerand's (2003), our study findings serve as a clear reminder that it is not only the provision of autonomy support that is important for motivationally adaptive outcomes for participants, competence support (structure and task-involvement) and relatedness support are as important. Therefore, future research should continue to examine the combined influence of these behaviours on the motivational climate created as well how and why the climate is created.

The empowering motivational climate created by the coaches in the current study was the result of intentional coaching strategies that aligned with their beliefs about coaching. Yet the resultant climate was, perhaps, more tacit as opposed to explicitly planned. That is, the climate was the result of how they ordinarily went about their coaching, largely second nature to them, rather than a specific focus. These findings are similar to Gray and Collins' (2016) findings that expert adventure sport coaches had well-developed intuitive interpersonal skills that were used to good effect but were not consciously or

declaratively employed in coaching sessions, or used at a strategic level to enhance participants' development. Acting 'intuitively' can, however, present a challenge for those working with coaches to develop their practice, because the coaches may not be aware of what they are doing or have not consciously considered why they behave as they do (Partington & Cushion, 2013). Therefore, supporting other coaches to create an empowering motivational climate could be enhanced by starting with a focus on raising awareness of how their current practices may create differing climates before discussing strategies that create an empowering climate.

An explanation for the intentional yet tacit nature of the empowering motivational climate is the connection we found between coaches' beliefs and values about how to approach coaching and the climate they worked to create. Although Mallet (2005) suggests an in depth understanding of motivation is required to create an empowering environment, this research would conclude differently. The coaches' beliefs and values drove the climate rather than their understanding of motivation per se. Beliefs and values are identified as a key part of a coaching philosophy which determines why they do what they do and how they behave in their coaching role, ultimately guiding and directing their coaching practice (Bennie & O'Connor, 2010; Nash, Sproule, & Horton, 2008). Research suggests that philosophies are not always enacted unless intentionally planned (Nash et al., 2008) and may be inhibited by organizational barriers (Cushion & Partington, 2016). However, similar to findings of research on other expert coaches, (e.g., Gould, Pierce, Cowburn, & Driska, 2017; Hodge, Henry, & Smith, 2014), the coaches in the current study had clear beliefs about what was important in how they approached coaching and had translated this into coaching strategies. Therefore, the current study provides valuable understanding of why the coaches created an empowering climate. Furthermore, this finding supports Mageau and Vallerand's (2003) proposed relationship between the coaches' personal orientation towards autonomy support and their autonomy supportive behaviour. To date, few researchers have examined antecedents of autonomy supportive coaching behaviours (Occhino et al., 2014), therefore this finding adds to our understanding of autonomy support provision as well as extending it by demonstrating that coaching philosophy was an antecedent of behaviours that also support relatedness and competence.

Despite strong consistent evidence of an empowering motivational climate, there was, however, some evidence of disempowering, particularly controlling, behaviours. This was explained by the coaching context (e.g., dynamic physical environment, weather, water levels) and characteristics of the participants (e.g., ability) which can thwart or support coaches' ability to behave as they desire (Hodge, Henry, & Smith, 2014; Iachini, 2013; Mageau & Vallerand, 2003; Occhino et al., 2014). Our findings, therefore, demonstrate interactions between personal orientation, the coaching context, and perceptions of participants' motivation and behaviour as antecedents of autonomy supportive behaviours (Mageau & Vallerand, 2003; Occhino et al., 2014).

For the coaches in the current study it was challenging, at times, to be empowering. This finding is similar to Callary et al. (2017) in their study of coaches of Masters sport, where some coaches felt it was risky and potentially problematic to give participants control over training. Some coaches in the Callary et al. study were concerned that giving participants' choice would disrupt their plans for the participants' workouts and there were tensions between the coaches' need for control and participants' desire for self-direction. In contrast, in the current study, the coaches' aimed to relinquish control and empower participants to be more independent performers, however, they felt they were not always able to do this. Constraining factors for the adventure sport coaches included: pressure, dynamic environment, and participants' wants and ability match. Consistent with others' findings (Iachini, 2013; Occhino et al., 2014), pressures on coaches' delivery, in our case due to limited time and/or prescribed course content, challenged coaches' ability to facilitate the desired empowering motivational climate. In addition, to our knowledge, this is the first study to identify the dynamic physical environment, along with participants' ability, and its implications for participants' safety as an antecedent of what might be viewed as less empowering and more disempowering coaching behaviours such as controlling behaviours.

Consideration should be given, however, to the role and interpretation of controlling behaviours. We found that in circumstances where participants' safety was in question, the coaches' actions were more controlling and yet in doing so the coaches demonstrated care (relatedness support) for the participants at the same time. Occhino et al. (2014) suggested that there may be times when it is appropriate for coaches to be more empowering and times when it is appropriate to be less so. Participant safety may

be one of these times and if the need is recognised by participants it may lead them to freely ‘give up’ their autonomy, therefore negating potentially negative consequences (Gilchrist & Mallett, 2017). In addition, as Appleton and Duda (2016) proposed, the undesirable consequences of a disempowering climate (e.g. over controlling) might be buffered when the climate is also empowering and this may have been the case in the current study. The climate the coaches created through emphasising relatedness support along with the provision of structure for competence development in an autonomy supportive manner is likely to have fostered trust and acceptance that there may be times where, in the best interests of the participants, coaches ‘need to be’ more controlling. Future research should continue to explore the conditions under which coaches feel constrained, the impact this has on their coaching behaviours, the subsequent motivational climate created and how coaches can be supported to cope with these constraints. Future research might also explore ‘acceptance’ by participants of controlling actions from those in leadership positions, such as coaches, and the circumstances in which it is accepted (or not), along with the subsequent motivational outcomes.

There was little difference between participants’, coaches’ and observers’ perceptions of the empowering/disempowering motivational climate. Furthermore, the coaches, if anything, tended to underestimate the empowering nature of their coaching behaviours compared with the participants and observers. This is in direct contrast to Smith, Smoll and Curtis’s (1978) findings where the coaches’ perceptions were generally overestimated. Smoll and Smith (1989) suggested that participants were considerably more accurate perceivers of coaches’ behaviours than coaches and suggested coach self-report methodologies should be used with caution. Our findings suggest otherwise. A plausible explanation for this difference is that the coaches in the current study were expert professional coaches whereas those in Smoll and Smith’s research, although not described in detail, were likely to be volunteer, amateur, and possibly inexperienced coaches. Being an expert does not automatically mean the coach is more self-aware, however, research does suggest that expert coaches have a clearer coaching philosophy (Nash et al., 2008), the underpinning beliefs and values of which were a key contributor to the motivational climate created by the coaches in the current study. Future research should more fully describe the backgrounds of coaches to enable potential explanations for discrepancies in findings when data are collected from multiple sources.



## **Limitations and future directions**

The focus of this study was to develop an in-depth examination of the motivational climate experienced by adult adventure sport participants. As a result our sample was limited in size, demographic and coaching context. Future research should continue to examine adult participants' perceptions of the motivational climate in a range sports including those with a competition-focus and non-competition focus as well as how the coaches create the climate, and the consequences for participants. The insight gained will be useful for coaches and organisers of adult sport to encourage adults into or back to sport and retain them as part of a physically active lifestyle, in particular when competition is not a central interest. An important contribution from our study, however, was the initial evidence of constraints to fostering an empowering climate. Future research should continue to explore both constraints and enablers to further our understanding of why and when coaches' do and do not create an empowering and/or disempowering motivational climate. Another limitation of the research was the difference in the dimensions in the observation tool (MMCOS, Smith et al., 2015) and the subscales in the perceived climate questionnaire (EDMCQ-C, Appleton et al., 2016). For example, structure and relatedness thwarting are not part of the EDMCQ-C. This limits exploration of participants' perceptions of these dimensions. The coaches' version of EDMCQ-C questionnaire also requires further testing to confirm its reliability.

## **Conclusion**

This study explored the coaching practices of coaches working in adult non-competitive settings, specifically examining the motivational climate in adult adventure sports from multiple perspectives, and was grounded in a multidimensional theoretical perspective which combines AGT and SDT (Duda, 2013). Perceptions of the environment were consistent across coaches, participants, and observers and demonstrated that the climate created by expert coaches was strongly empowering with only weak disempowering dimensions. The study provides valuable insight into the motivational climate created by adventure sport coaches. The climate was founded in coaches' beliefs about coaching which aligned with an empowering approach. These beliefs were translated into observable strategies that were intentional because they emanated from the coaches' beliefs. However, the resultant empowering motivational climate perceived by the adults being coached and by the observers, was tacit, almost

674 second nature, to the coaches. Structure had a clear place in the empowering climate and appeared to  
675 support rather than constrain autonomy. Relatedness support was also a prominent feature of the climate  
676 and perhaps buffered the potentially negative consequences of the few controlling behaviours coaches  
677 felt, at times, were needed often related to the interaction between the challenges presented by the  
678 physical environment and the adults' ability or perception of ability. These findings extend previous  
679 research that has largely focused on competitive sport participants and especially youth and collegiate  
680 participants' perceptions. The study demonstrates the value of employing a multiple methods approach  
681 to provide detailed analysis of the motivational climate with different participants and sporting contexts.

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844 Table 1. Summary of the expert coaches' background.

Code	Age	Adventure Sport	Years coaching experience	Qualifications*
C1	44	Winter mountaineering	17	MIC, BA Degree
C2	30	Skiing	10	MIC, MSL, BASI L3
C3	41	White water kayaking	17	BCU L5 Coach, BSc Degree
C4	38	Rock climbing	17	MIC, Climbing development coach, PGCE
C5	25	Mountain biking	10	BC L3 MTB Leader, UKCC L2, BA Degree
C6	48	Canoeing	22	BCU L5 Coach, UKCC L4, MSc

845 \* MIC = Mountain Instructor Certificate; MSL =Mountain Ski Leader; BASI L3 = British Association of  
846 Snowsport Instructors Level 3; BCU L5 Coach; British Canoe Union Level 5 Coach; PGCE = Postgraduate  
847 Certificate in Education; BC L3 = British Cycling Level 3 Mountain Bike Leader; UKCC = United Kingdom  
848 Coaching Certification  
849

850 Table 2. Descriptive statistics for participants' and coaches' perceptions of environmental dimensions and overall motivational climate

	Coach												Coaches (N=6)	Learners (N=25)
	1	2	3	4	5	6								
	Coach	Learners (n=4) M (SD)	Coach	Learners (n=5) M (SD)	Coach	Learners (n=4) M (SD)	Coach	Learners (n=2) M (SD)	Coach	Learners (n=8) M (SD)	Coach	Learners (n=2) M (SD)	M (SD)	M (SD) alpha
<b>Dimension</b>														
Task-involving	3.67	4.17 (0.35)	4.11	4.22 (0.52)	4.56	4.39 (0.42)	4.00	4.44 (0.47)	3.78	4.33 (0.35)	3.22	4.06 (0.39)	3.89 (0.45)	4.28 (0.38) 0.75
Autonomy-supportive	4.00	4.20 (0.33)	4.40	4.12 (0.36)	4.20	4.35 (0.47)	4.40	4.50 (0.14)	4.60	4.20 (0.47)	4.20	4.00 (0.00)	4.30 (0.21)	4.22 (0.38) 0.43
Socially-supportive	4.00	4.00 (0.27)	4.33	4.67 (0.41)	4.33	4.42 (0.42)	4.33	4.50 (0.71)	4.00	4.38 (0.63)	4.00	4.67 (0.47)	4.17 (0.18)	4.41 (0.50) 0.78
Ego-involving	1.71	1.50 (0.59)	2.00	1.23 (0.30)	1.43	1.43 (0.45)	1.86	1.43 (0.40)	2.00	1.38 (0.34)	2.00	1.43 (0.61)	1.83 (0.23)	1.38 (0.38) 0.84
Controlling	1.80	1.60 (0.65)	1.70	1.46 (0.40)	1.60	1.38 (0.15)	1.80	1.70 (0.28)	1.40	1.48 (0.33)	2.40	1.50 (0.14)	1.78 (0.34)	1.50 (0.35) 0.79
<b>Overall Climate</b>														
Empowering	3.89	4.12 (0.25)	4.28	4.34 (0.36)	4.36	4.39 (0.42)	4.24	4.48 (0.44)	4.13	4.30 (0.43)	3.81	4.24 (0.29)	4.12 (0.22)	4.30 (0.35)
Disempowering	1.76	1.55 (0.61)	1.85	1.34 (0.32)	1.51	1.40 (0.29)	1.83	1.56 (0.34)	1.70	1.43 (0.32)	2.20	1.46 (0.35)	1.81 (0.23)	1.44 (0.35)

851 Note. Mean values scale range is 1 to 5: 1 = Strongly disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly agree

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853

854 Table 3. Potency of observed environmental dimensions and overall motivational climate

	C1				C2				C3				C4				C5				C6				<i>M (SD)</i> ICC
<b>Dimension</b>	T1 <sup>1</sup>	T2 <sup>1</sup>	T3 <sup>1</sup>	Tot <sup>2</sup>	T1	T2	T3	Tot	T1	T2	T3	Tot	T1	T2	T3	Tot	T1	T2	T3	Tot	T1	T2	T3	Tot	
Autonomy-supportive	2	2	2	6	3	2	2	7	2	3	3	8	2	3	3	6	2	2	3	6	2	3	3	8	6.83 (0.98) .65
Task-involving	2	2	1	5	3	3	2	8	1	2	2	5	2	2	2	5	2	2	2	7	2	2	2	6	6.00 (1.26) .71
Relatedness-supportive	2	2	2	6	2	2	2	6	2	3	3	8	2	2	2	6	2	2	2	6	3	3	2	8	6.67 (1.03) .69
Structured	3	3	3	9	3	3	3	9	3	2	3	8	2	3	2	9	3	3	3	9	3	3	2	8	8.67 (0.52) .75
Controlling	1	1	0	2	1	0	0	1	1	1	0	2	0	0	1	2	1	0	0	1	0	0	0	0	1.33 (0.82) .74
Ego-involving	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00 (0.00) -
Relatedness-thwarting	1	1	1	3	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.67 (1.21) .97
<b>Overall climate<sup>1</sup></b>																									
Empowering <sup>3</sup>				2				3				3				3				2				3	2.67 (0.52) .67
Disempowering <sup>3</sup>				1				0				0				0				1				0	0.33 (0.52) .76

855 <sup>1</sup> Maximum score out of 3: 0 = Not at all; 1 = Weak emphasis; 2 = Moderate emphasis; 3 = Strong emphasis; <sup>2</sup> Maximum score out of 9: 0 = Not at all; 1-3 = Weak emphasis;  
856 4-6 = Moderate emphasis; 7-9 = Strong emphasis; T = 10 min period at start (T1), middle (T2), and end (T3) of coaching session; <sup>3</sup> Overall climate potency was  
857 determined for the session as a whole; ICC = interclass correlations

858 Table 4: Frequency of observed empowering behaviours collapsed across all coaches' sessions

Climate dimension	Coaching behaviours	Total
Empowering dimensions		
Autonomy- supportive	Provides opportunity for learner input	94
	Provides rationale for tasks	80
	Encourages intrinsic interest	64
	Provides meaningful choice	60
	Acknowledges feelings & perspective	60
Task-involving	Emphasized task-focused competence feedback	76
	Emphasizes/recognizes effort and/or improvement	58
	Uses cooperative learning	38
Relatedness-supportive	Adopts a warm communication style	88
	Ensures athletes are included in drills/activities/exercises	83
	Shows care and concern for athletes	47
Structured	Provides guidance through drills/activities/exercises	87
	Provides instruction and organization	68
	Offers expectations for learning	48
Disempowering dimensions		
Controlling	Uses controlling language	10
	Devalues learners' perspective	1
	Uses extrinsic rewards	0
	Relies on intimidation	0
	Demonstrates negative conditional regard	0
	Uses overt personal/physical control	0
Ego-involving	Punishes mistakes	0
	Emphasizes/recognizes inferior/superior performance and ability	0
	Encourages inter/intra group rivalry	0
Relatedness thwarting	Restricts opportunities for interactions and conversation	8
	Excludes athletes from certain drills/activities/exercises	0
	Shows a lack of care and concern for learners	0
	Belittles (makes attempt to embarrass) learners	0
	Adopts a cold communication style	0

859

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