

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23

An examination of the coach-created talent development motivational climate in Canoe
Slalom in the United Kingdom.

Stephen Macdonald, British Canoeing, Scotland

Justine Allen, University of Stirling, Scotland

Date of submission: 1st November, 2017

Date of revision: 17th April, 2018

Date of 2nd revision: 20th September, 2018

Corresponding Author and contact details:

Justine Allen

Email: justine.allen@stir.ac.uk

Address:

Faculty of Health Sciences and Sport,

Pathfoot Building

University of Stirling,

Stirling,

FK9 4LA

United Kingdom

24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47

Abstract

This study examined the coach-created talent development motivational climate in Canoe Slalom in the United Kingdom using achievement goal theory, self-determination theory and transformational leadership. The participants were six (five male, one female) full-time Canoe Slalom talent development coaches and twenty-four athletes (13 male, 11 female). A multidimensional, mixed methods approach examined participants' perceptions of the motivational climate, transformational leadership behaviours, coaching practices, and coaching philosophies. Data were collected through questionnaires, interviews, and systematic observation. A summary of the coaching climate, practices, and philosophy was developed for each coach based on the perspectives of the athletes, coach, and observer. These were then compared and commonalities and differences amongst the coach-created climates were identified. The coaches created a motivationally adaptive (structured, relatedness supportive, individually-focused, task-involved) talent development motivational climate. However, the coaches varied in the extent to which the climate was autonomy supportive and intellectually stimulating. Analysis of the coaching climates using Nelson and Colquhoun's (2013) learning continuums revealed two distinct forms of climate: behaviourist/structure and humanistic/agency. The implications for talent development and key stakeholders are discussed.

Key words: talent development environment, interpersonal coaching behaviours, learning theory

48 Introduction

49 In sport, many factors need to come together in the life of an aspiring athlete to
50 facilitate successful transition to elite levels of performance (Côté, Lidor & Hackfort 2009).
51 These factors are wide ranging (e.g., innate, behavioural, psychological, sport culture)
52 (Coutinho, Mesquita & Fonseca, 2016; Mills, Butt, Maynard, & Harwood, 2012), however,
53 the importance of the talent development environment (TDE) and the coach's central
54 influence within it, have been consistently documented (e.g., Henriksen, Stambulova, &
55 Roessler, 2011; International Council for Coaching Excellence (ICCE), 2013; Mills, Butt,
56 Maynard, & Harwood, 2014a; Martindale, Collins, & Daubney, 2005). To date, examinations
57 of the characteristics of TDEs have been holistic and largely descriptive (Henriksen,
58 Stambulova, & Roessler, 2010a). An approach with potential to provide a theoretically based
59 in-depth exploration of, at least the central feature of TDEs (i.e., coach-athlete interactions),
60 is the coach-created motivational climate. In addition, some researchers (e.g., Allen & Hodge,
61 2006; Duda 2013; Mallett & Hanrahan, 2004; Morgan, 2017; Vella & Perlman, 2014) have
62 brought together multiple theories to understand the coach-created environment. Therefore,
63 the purpose of this study was to adopt a multidimensional view to examine the coach-created
64 talent development motivational climate in Canoe Slalom in the United Kingdom (UK).

65 A wide range of potential factors that affect talent development have been identified
66 through research and demonstrate the complex and multidimensional nature of the TDEs
67 (e.g., Coutinho, et al., 2016; Henriksen, et al., 2010a; 2010b; 2011; Martindale, Collins, &
68 Abraham, 2007; Mills et al., 2014a). Factors include a long-term vision, coherent messages,
69 clear expectations, winning in perspective relative to development, encouraging self-
70 responsibility and autonomy, and an individualised approach to development and support
71 (Martindale et al., 2007; Martindale, Collins, Douglas, & Whike, 2012). They can also
72 include preconditions (e.g., coaching resources, financial, material), processes (e.g., training,

73 social events), individual developments and achievements (e.g., physical, psychological
74 skills), and organisational culture (e.g., cultural stories, espoused values, basic assumptions).
75 These factors can affect talent development at the macro level (e.g., wider culture, media,
76 education systems, sports federations) and micro level (e.g., immediate coaching
77 environment) (Henriksen et al., 2010a).

78 An example of research in this area is two separate studies in which Mills et al.
79 (2014a; 2014b) explored athletes' and coaches' perspectives of the TDE of football
80 academies. Their findings were largely consistent with existing research on factors important
81 to the TDE. Unfortunately, a direct comparison between the coaches' and athletes'
82 perspectives is limited because it is not clear whether the two studies were reporting on the
83 same TDEs. Therefore, to provide an in-depth understanding of the TDE it will be useful to
84 examine multiple perspectives (e.g., athletes, coaches) of the same TDE (Coutinho, et al.,
85 2016). In addition, existing research does not indicate which specific factors are responsible
86 for success or how they are implemented (Henriksen, et al., 2010a). The central position
87 given to communication and interactions between coach and athlete, suggests that examining
88 what coaches do and why and how this is perceived by athletes will enhance understanding of
89 this critical micro layer of the TDE (Coutinho, et al., 2016).

90 The concept of the motivational climate has much to offer examinations of TDEs, in
91 particular, with regard to the interactions between coaches and athletes at the micro level.
92 Through their actions, and non-actions, coaches convey information about what athletes
93 should consider as important in that particular context, thereby creating the motivational
94 climate (Ames, 1992). Furthermore, this coach-created social context influences participants'
95 experiences of sport (Mageau & Vallerand, 2003). The motivational climate has been
96 examined in youth (e.g., Smith, Smoll, & Cumming, 2007) and elite sport contexts (e.g.,
97 Pensgaard & Roberts, 2002; Lara-Bercial & Mallett, 2016), however, little is known about

98 the coach-created talent development motivational climate. [During the development phase](#) in
99 athletes' careers tension may arise between performance development (long term self-
100 referenced 'successes') and performance outcomes (immediate 'normative successes' for
101 selection purposes) and the 'messages' about what is important and valued (motivational
102 climate) may become confused or even conflicted. Therefore, an examination of the coach-
103 created motivational climate and behaviours that shape it in TDEs can provide valuable
104 insight into the features of 'productive' climates for athletes at this stage in their careers.

105 Two theories have been prominent in conceptualizing the motivational climate,
106 achievement goal theory (AGT) (Nicholls, 1989) and self-determination theory (SDT) (Ryan
107 & Deci, 2000) ([for reviews see Gilchrist & Mallett, 2017; Harwood, Keegan, Smith, & Raine, 2015; Occhino, Mallett, Rynne, & Carlisle, 2014](#)). AGT focuses on how ability is understood
108 in a given context. [According to AGT](#), a coach that emphasizes a self-referenced concept of
109 ability through a focus on effort, learning, and individual improvement, is deemed to create a
110 task-involving motivational climate. A coach that emphasizes judging one's ability by
111 comparison to others and suggests that effort and mistakes are a sign of low ability, is
112 deemed to create an ego-involving motivational climate. [SDT, in particular the mini theories](#)
113 [of cognitive evaluation theory, basic needs theory, and organismic integration theory, focuses](#)
114 [on how the social context influences behavioural regulation \(self-determined and non-self-](#)
115 [determined motivation\) through facilitating or thwarting the satisfaction of three basic](#)
116 [psychological needs: autonomy, competence, and relatedness. According to SDT, a social](#)
117 [context that supports need satisfaction is characterized by individuals in a position of](#)
118 [authority \(e.g., coaches\) providing autonomy support, structure, and involvement, whereas a](#)
119 [social context that thwarts need satisfaction is characterised by controlling actions and a lack](#)
120 [of connection with participants \(Mageau & Vallerand, 2003\).](#)

122 Mallett and Hanrahan (2004) employed multiple social cognitive theories of
123 motivation, including AGT and SDT, to examine the motivational forces behind elite
124 athletes' performance. They argued that future research should examine multiple theories of
125 motivation to provide a comprehensive investigation of motivation and potential for
126 conceptual convergence across models of motivation. Consistent with this multi-theories
127 perspective, Allen and Hodge (2006) proposed the integration of AGT and SDT when
128 considering how coaches create an optimal learning environment for athletes. Subsequently,
129 Duda (2013) proposed a multidimensional, empowering and disempowering, view of the
130 coach-created motivational climate. An empowering motivational climate is task involving,
131 autonomy supportive, and supports relatedness. In contrast, a disempowering motivational
132 climate is controlling, ego-involving, and thwarts relatedness.

133 Research from AGT and SDT perspectives separately, and the integrated perspective,
134 generally demonstrates that the empowering dimensions are associated with desirable
135 outcomes for participants such as superior performance, positive perceptions of competence
136 and self-worth, self-determined motivation, adaptive practice and competition strategies, and
137 positive affective states. In contrast, disempowering dimensions are associated with more
138 motivationally maladaptive outcomes for participants such as attrition, extrinsic motivation,
139 amotivation, maladaptive strategies, negative affect, and feelings of lower positive affect and
140 autonomy (for reviews see Gilchrist & Mallett, 2017; Harwood, Keegan, Smith, & Raine,
141 2015; Occhino, Mallett, Rynne, & Carlisle, 2014). Research has typically employed large
142 scale, self-report questionnaire-based methods with youth sport participants or tertiary
143 education participant and more recently systematic observation in youth sports (e.g., Smith et
144 al., 2016). One notable exception to this focus on youth sports and large-scale quantitative
145 research is Mallett's (2005) qualitative case study of autonomy supportive coaching with elite
146 performance athletes. Much less, however, is known about the motivational climate in TDEs,

147 including what coaches do that creates the motivational climate and why they behave as they
148 do. A closer examination of the motivational climate in TDEs is warranted because it is at
149 this time in athletes' development when competing agendas may arise (e.g., development vs.
150 performance), which could affect the motivational climate and ultimately the development of
151 athletes' talent.

152 Transformational leadership (TL) (Bass & Riggio, 2006), although not a theory, also
153 has potential to further our understanding of TDEs at the micro level. It has been connected
154 with the motivational climate (Stenling & Tafvelin, 2014; Vella & Perlman, 2014) and has
155 also been employed as the guiding framework for a continuing professional development
156 workshop for coaches with the aim of promoting positive youth development in sport
157 (Turnnidge & Côté, 2017). TL occurs when coaches influence athletes by focusing on their
158 goals and providing them with the confidence to extend their performance. In other words,
159 the coach engages in behaviours designed to empower, inspire and challenge athletes
160 (Callow, Smith, Hardy, Arthur, Hardy, 2009). TL behaviours emphasise a growth-oriented
161 process and promote autonomous action, which is similar to the support for autonomy and
162 structured development of competence in an empowering motivational climate (Stenling &
163 Tafvelin, 2014). The growth-oriented focus is also consistent with a mastery motivational
164 climate.

165 There are four main TL behaviours: idealized influence, inspirational motivation,
166 intellectual stimulation, individualized consideration. In addition, two further TL behaviours
167 have been identified as relevant to sport: high performance expectations, fostering group goal
168 acceptance; as well as one transactional behaviour: contingent reward (Callow et al, 2009).
169 TL behaviours have been associated with a range of desirable outcomes for participants
170 including improved performance but also basic needs satisfaction, well-being, life skills
171 development, group cohesion (Kirkpatrick & Locke 1996; Callow et al., 2009; Stenling &

172 Tafvelin, 2014). There are similarities among some TL behaviours and empowering/
173 disempowering behaviours. For example, intellectual stimulation with its emphasis on
174 encouraging athletes' cognitive engagement and decision making has clear parallels with
175 autonomy supportive behaviours such as providing choice and opportunities to show
176 initiative. However, other TL behaviours such as high expectation and role modelling are not
177 as clearly part of the empowering/disempowering motivational climate dimensions.
178 Furthermore, little is known about the extent to which coaches in TDEs engage in TL
179 behaviours and how these behaviours contribute to the motivational climate. Therefore,
180 examination of these behaviours as well as empowering/disempowering behaviours allows
181 for a more complete examination of the coaching behaviours shaping the motivational
182 climate in TDEs.

183 One other topic central to coaching and relevant to TDEs is athletes' learning. As
184 Nelson and Colquhoun (2013) noted "the facilitation of athlete learning is arguably one of the
185 few outcomes that all coaching practitioners desire, irrespective of the context in which they
186 work" (p. 284). They argued, as have others (e.g., Cushion, 2010), that coaches' view of
187 learning will influence how they go about their practice and, we argue, coach-athlete
188 interactions and motivational climate. To better understand how coaches view learning,
189 Nelson and Colquhoun suggested researchers consider perspectives of learning from
190 psychology (i.e., behaviourism and humanism) and sociology (i.e., structure and agency).

191 Humanism assumes that an individual has unlimited potential for change and growth
192 and as such is an optimistic philosophy. With a humanistic approach to athletes' learning
193 coaches will facilitate athletes' commitment to the process of learning, support them to make
194 responsible choices and encourage them to engage in an ongoing process of self-
195 understanding (Nelson & Colquhoun, 2013). In a similar manner, empowering and
196 transformational behaviours such as emphasizing self-referenced competence, acknowledging

197 athletes' perspectives, providing opportunities to make meaningful choices, complete
198 individual tasks and intellectual stimulation also seek to facilitate participants' engagement
199 rather than control it. Nelson and Colquhoun position a behaviourist approach at the opposite
200 end to humanistic on a psychological view of learning continuum. A behaviourist view sees
201 the athlete as being "like a complex machine, whose behaviour needs to be controlled and
202 shaped by the coach" (p. 286). A coach with this view of learning is likely to seek to control
203 athletes' learning, perhaps being overtly controlling and critical through feedback that
204 emphasizes 'the correct' way to do things and reinforcing 'correct' performance through
205 tangible rewards such as praise, reminiscent of a disempowering, transactional climate.

206 From sociology, are the structure and agency perspectives of learning. Structure
207 draws from a functionalist position where individuals are programmed into the norms of the
208 system. In this system, society (e.g., sport or TDE) has a defined framework of expectations
209 that shape an individual's relations and governs their actions. This perspective leaves little
210 room for individual control over one's own actions (Nelson & Colquhoun, 2013). The coach
211 may be the architect of this structure in the TDE, setting expectations and defining goals,
212 which shape the athletes' actions. The resulting climate is likely to be experienced as
213 structured and controlling. In contrast, although influenced by the context in which we exist,
214 we do make choices. Therefore, there is an element of agency in our actions (Nelson &
215 Colquhoun, 2013). A coach who recognizes athletes' agency is likely to involve athletes
216 more in the learning process, even encouraging them to 'take the lead' in the process. In this
217 case the climate would be experienced more autonomy supportive and transformational.

218 In summary, the TDE is multidimensional and complex (Henriksen, et al., 2010a;
219 2010b, 2011). Not ignoring or discounting this complexity, we sought to provide greater
220 depth to our understanding of the micro layer by adopting a multidimensional view of the
221 motivational climate and consideration of coaches' perspectives on learning. Therefore, the

222 purpose of this study was to examine the coach-created talent development motivational
223 climate in Canoe Slalom in the UK. Specifically, we examined what coaches convey about
224 what is important in their talent development context (empowering/disempowering climate),
225 what coaches do (coach-athlete interactions and leadership behaviours), and why they act as
226 they do (intentions, philosophy, and perspectives on learning).

227 Method

228 Participants

229 Six coaches aged 28 to 59 years ($M=40.7$, $SD=12.8$) participated in this study. Each
230 coach was employed in a full time role at one of the seven talent development centres in the
231 UK. There were five different centres represented in the sample geographically they covered
232 South Wales, England, and Scotland. This was a significant sample, representing two thirds
233 of the full-time employed coaches working with talent development canoe slalom athletes in
234 the UK at the time of the study (Trollope, 2015). In Canoe Slalom ‘talent development’
235 involves working with the junior athletes (under 18 years of age) who are progressing along a
236 managed Home Nation or Regional pathway aiming to achieve selection to Great Britain
237 Junior programmes. Five of the coaches were male and one was female. This is representative
238 of the gender split of coaches in the sport as a whole (Trollope, 2015). To preserve the
239 anonymity of all coaches they will be referred to as ‘he’ and each coach was given a male
240 pseudonym. All the coaches were experienced coaches, coaching for 7 to 35 years, ($M=14.3$)
241 and had spent a similar amount of time in the TDE in their current roles, 1 to 7 years,
242 ($M=3.5$). All were former national age group or senior canoe slalom athletes. All six coaches
243 had delivered ‘results’ within the talent development pathway and were considered
244 ‘productive’, even successful, coaches within talent development in the sport. That is, they
245 worked with athletes who had achieved the race results needed to graduate to the next
246 stage(s) of the British Canoeing slalom athlete performance pathway.

247 Twenty four athletes participated in the study (11 female and 13 male). Athletes were
248 in the age category J14-20 (14 to 20 years of age, M=16.2). The athletes were regularly
249 coached by the participating coaches, between 2 and 10 sessions per week. Therefore, they
250 knew the coaches well and were in a position to make comment on the coaching they
251 received. With regard to the key stages in athlete development (e.g., sampling, specialising,
252 investment, maintenance) (Côté, et al., 2009) these athletes were in late specialisation and
253 early investment years. They were part of a structured British Canoeing development
254 pathway in which there is a finite window of opportunity for athletes to progress to elite
255 national squads (e.g., J18, U23, GB podium potential and GB podium).

256 Procedure

257 Ethical approval was granted by the authors' institution. The coaches were then
258 contacted by email or phone using the first author's contacts within the sport. The purpose of
259 the study and what was involved was explained. Each of the coaches approached agreed to
260 take part in the study. The athletes of these coaches were then invited to participate in the
261 study. All athletes agreed to take part in the study.

262 Data were collected during and after a training session 2 or 3 days before a significant
263 competition (e.g., J18 (under 18 years of age) selection race or an important national race
264 leading to promotion to Premier Division). This was deemed a critical time for the athletes
265 because of the potential for performance and development outcomes to conflict and affect the
266 TDE. Data collection was conducted by the first author, who was suitably experienced to
267 understand the coaching interactions in a canoe slalom coaching session. He has spent the
268 previous seven years coaching canoe slalom in a talent development context and holds the
269 British Canoeing UKCC Level 4 coaching award. Additionally, he has 30 years coaching
270 experience in paddlesports and 22 years as a coach educator within the sport. Due to his
271 prolonged engagement in the context the first author was known informally to the coaches

272 and athletes who participated in the study, however, he did not work with or coach any of the
273 participants. Immediately after the observed session, athletes completed the questionnaire. At
274 a time convenient to the coach (within 24 hours of the observed session) the semi structured
275 interview was conducted.

276 Data Collection

277 To provide a comprehensive understanding of the motivational climate created by the
278 coach, data were collected from multiple sources (questionnaire, interview, observation) and
279 from three perspectives (athlete, coach, observer) (Smith, 2010). A summary of the methods
280 employed, their purpose, and data generated is presented in Table 1.

281 *Systematic observation of coaching (observer's perspective):*

282 The interactive and leadership behaviours the coaches employed and the motivational
283 climate created during the training session were captured through video and audio recordings
284 and field notes. The video was positioned on the bank (river or course) near the coach so that
285 his/her actions were visible but so as to avoid impinging on the coach's or athletes'
286 performance. The coach also wore a lapel microphone during the session.

287 *Coaching interactions.* Based on a review of the coaching behaviour literature (e.g.,
288 Cushion, 2010), a template of eight behaviours was created to record the time spent engaged
289 in coaching interactions. Our focus was on the nature of the information exchange between
290 the coach and athlete, in particular, the extent to which the coach was 'telling' the athlete
291 what to do, how much discussion was taking place between coach and athlete, and the way in
292 which questioning was being used by the coach (if at all). Rather than focus on the number of
293 behaviours exhibited, which is common practice in systematic observations (e.g., Cushion,
294 2010), we calculated the percentage of time the coach devoted to each of the behaviours. This
295 is useful because a conversation between coach and athlete that lasts a few minutes might
296 only be recorded as one instance of a behaviour, if only the number of behaviours is recorded.

297 However, the conversation maybe critical to the athlete's understanding of what they need to
298 do or why. The eight behaviours recorded were: (a) course description (i.e., coach explaining
299 the sequence of gates to be negotiated); (b) coach feedback (i.e., feedback provided about the
300 performance not in response to athlete input); (c) coach-initiated tactical input (i.e., coach's
301 input provided without any initiation from athlete); (d) tactical input response (coach's
302 response to athlete's question/comment); (e) coach question to open the conversation; (f)
303 coach question to develop athlete understanding; (g) athlete input (all input into the
304 interaction such as asking/answering questions, checking their understanding); and (h)
305 interactive (a 'catch all' category covering non-performance-related discussions).

306 *Empowering/disempowering motivational climate.* To determine the extent to which
307 the coach-created an empowering or disempowering motivational climate, the video and
308 audio recording of the session was analysed using the Multidimensional Motivational
309 Climate Observation System (MMCOS) (Smith, et al., 2015). The MMCOS contains 32
310 behaviours organised into seven strategies. The empowering climate dimensions are:
311 autonomy-supportive; task-involving; relatedness supportive; and structure. The
312 disempowering dimensions are: controlling; ego-involving; and relatedness thwarting. For
313 each coach observation, the strength (potency) of each dimension was scored on a four-point
314 scale: 0 (not at all), 1 (weak), 2 (moderate), 3 (strong) (Smith, et al., 2015). Empowering and
315 disempowering climate potency scores were calculated by averaging the dimension scores.

316 *Transformational leadership behaviours.* There is no existing observation tool
317 available to systematically observe transformational leadership behaviours, therefore, we
318 used the definitions of the four transformational behaviours: idealised influence; inspirational
319 motivation; intellectual stimulation; and individual consideration plus the 3 additional
320 behaviours (high performance expectations, fostering group goal acceptance, contingent
321 reward) from the DLTI (Callow, et al., 2009) as the framework. We followed a process

322 similar to that employed with MMCOS (Smith, et al., 2015), recording the strength of each
323 TL behaviour on a four-point scale: 0 (not at all), 1 (weak), 2 (moderate), 3 (strong).

324 *Coaching behaviours and practice (athletes' perspectives).*

325 Athletes completed the Differentiated Transformational Leadership Inventory (DTLI)
326 (Callow, et al., 2009). Participants responded to each of the 27 items assessing 7 leadership
327 behaviours on a 5 point Likert scale anchored by 1 (not at all) to 5 (all of the time). [The](#)
328 [internal reliability \(Cronbach's alpha coefficient\) for the subscales were:](#) (a) individual
329 consideration (0.66); (b) inspirational motivation (0.59); (c) intellectual stimulation (0.67);
330 (d) idealized influence (0.78); (e) high performance expectations (0.73); (f) fostering group
331 goal acceptance (0.68); and (g) contingent reward (0.83). In addition, athletes provided
332 written answers to a series of short open-ended questions exploring their perceptions of the
333 coach's practices and how the coach helped them to prepare them (e.g., "how similar was this
334 session to previous sessions this year?" and "in what ways does your coach encourage you to
335 understand why certain techniques work best?"). Questions are available from the authors.

336 *Coaching practice and philosophy (coaches' perspectives):*

337 The coaches' perspectives were captured by a semi-structured interview following the
338 observed coaching session. In keeping with guidelines for semi-structured interviews (Patton,
339 2002), a set of general questions were developed covering coaching background (e.g.,
340 experience, qualifications) and approach to coaching, common practices, and why they coach
341 as they do. The questions were not specifically about the motivational climate or TL
342 behaviours, rather they were kept broad and open to encourage the coach to describe his/her
343 approach to coaching without being constrained by particular theoretical concepts. The
344 interview questions are available from the authors on request. The general questions were
345 supplemented by follow-up questions and probes to further explore the coaches' perspectives

346 (Patton, 2002). To keep the interviews to a reasonable length whilst still gaining in-depth
347 information, the coaches provided their coaching philosophy, via email, after the interview.

348 Preliminary data analysis

349 Each author watched the video recorded sessions separately and scored the strength of
350 the empowering/disempowering climate and TL behaviours. To check for reliability of
351 scoring, the scores generated were compared and any discrepancies were discussed. If
352 necessary the video recording was reviewed to assist the discussion and achieve consensus on
353 the score for each dimension/behaviour for each coach (Morgan, Muir, & Abraham, 2014).
354 For one coach, the video recording failed, in this case field notes were used to contribute to
355 the preliminary analysis of the coach's motivational climate and TL behaviours. From the
356 athletes' responses to the DTLI, the means were calculated for each of the seven TL
357 behaviours for each coach. The athletes' responses to the open-ended questions and the
358 coach's interview and coaching philosophy data were content analysed (Patton, 2002). This
359 process involved each author reading and re-reading the responses to become familiar with
360 the data, the first author identified the initial meaning units, followed by review of the
361 meaning units and organised them into lower and then higher order themes. These were then
362 discussed with the second author who took on the role of critical evaluator (Patton, 2002) and
363 between the authors the final higher order themes were established.

364 Main analysis

365 To describe the multidimensional nature of the coach-created talent development
366 motivational climate in Canoe Slalom in the UK and how it was created two further stages of
367 analysis were conducted similar to the process employed by Gould, Guinan, Greenleaf,
368 Medbury, and Peterson (1999): 1) development of summary profiles of the talent
369 development motivational climate; 2) comparison of climate profiles.

370 *Stage 1: Summary profiles of the talent development motivational climate*

371 Using the multiple data sources, the authors separately developed a summary profile
372 for each coach. The summaries were shared and discussed with the intention to explore any
373 discrepancies between researchers' interpretations (Gould, et al., 1999). Few discrepancies
374 occurred and consensus was reached on the talent development motivational climate created.

375 *Stage 2: Comparison of climate profiles*

376 The profiles of the six coaches were then compared to identify common and unique
377 features of the talent development coaching climate created by these coaches. At this stage
378 the coach's espoused and enacted perspective on learning were examined using Nelson and
379 Colquhoun's (2013) behaviourist/humanistic and structure/agency continuums framework.

380 *Trustworthiness of the data and interpretation*

381 There is no one way to ensure the trustworthiness of the research (Cresswell & Miller,
382 2000). The 'measures' taken to for this purpose included the first author's prolonged
383 engagement with the talent development context; rigorous systematic data collection
384 processes; cross-checking and triangulation of information and interpretations; discussion and
385 consensus amongst researchers about the interpretation and meaning of the data. The first
386 author's background ensured familiarity with the context, the participants (and participants
387 with the researcher), the way things are done, and knowledge and language specific to that
388 context (Cresswell & Miller, 2000). Such engagement with the context was useful in
389 constructing the meaning of coaches' and athletes' comments and behaviours during analysis.
390 The established rapport with participants helped create an environment where they could feel
391 comfortable and supported to provide 'true' accounts of their experiences (Cresswell &
392 Miller, 2000). Furthermore, we employed measures with established validity and reliability.
393 The multiple sources and perspectives enabled us to cross-check the information gathered.
394 The authors independently analysed the data and discussed interpretations, returning to the
395 data if needed to re-examine it, and enable a consensus to be reached on what the data were

396 telling us about the nature of the talent development motivational climates. This cross-
397 checking provided triangulation of data and interpretations, which is useful to establish the
398 credibility of the research and its findings (Patton, 2002).

399 Results

400 Stage 1: Talent development motivational climate profiles.

401 Summary descriptive findings of the time spent in the eight interaction behaviours,
402 observed multidimensional motivational climate, observed TL behaviours, and athletes'
403 perceptions of TL behaviours are presented in Tables 2-4. The profiles developed for each
404 coach are described below and include illustrative quotes from athletes and coaches. All
405 athletes indicated that the session observed was typical of pre-competition sessions.

406 *Coach 1: James*

407 James had an established relationship with the athletes with plenty of 'social chat'
408 evident (e.g., 12.0% of interaction time). He provided a structured training environment (e.g.,
409 28.8% of interaction time on course description) that was neither obviously empowering nor
410 disempowering. Interactions demonstrated consideration for individuals' needs, however,
411 there was limited observed evidence of other TL behaviours. Exchanges with athletes were
412 individualised, coach driven, and focused on providing tactical input. Of the interaction time,
413 44.5% was coach-initiated tactical input and 5.5% was tactical input in response to athletes'
414 comments or questions. An example of this was the process whereby after a performance
415 effort the athlete paddled to James and waited for input from him. On the few occasions
416 questions were asked (1.9% of interaction time) any conversation was quickly closed down
417 by the delivery of tactical input before the athletes had an opportunity to respond. The
418 athletes (N=3) perceived James to engage in transformational behaviours 'fairly often'
419 (M=3.96, range: inspirational motivation, M=4.33, to role model, M=3.33). Somewhat
420 contrary to the evidence from the observation, the athletes stated that James used questioning

421 to make them think before providing input (e.g., “asked how I felt before giving me his
422 feedback”). More consistent with the observation findings, however, was the athletes’
423 perception that their role during training sessions was to “concentrate on feedback and apply
424 [it] on [the] next run.” James’ perspective on coaching reflected a culture of high
425 performance, conveying high expectations for performance, it is “something they are all
426 committed to doing,” and fostering agreement of goals. He indicated a desire to understand
427 the athlete’s perspective, “I don’t know what they think or feel so asking questions [gives me
428 that perspective].” However, his philosophy centered on ‘making a difference’ and what he,
429 as the coach, would do. In practice this translated into a direct instructional style of coaching,
430 which allowed for little interaction.

431 *Coach 2: Iain*

432 The nature of the session (progressive session with ‘walk backs’ where the athletes
433 negotiate a short sequence of gates as they progress down the course) limited Iain’s
434 opportunity for input (30.1% of coaching session). The input provided focused on tactical
435 information (51.9% of interaction time) and was delivered through an interactive process,
436 which involved asking a question, listening to the athletes’ responses (20.1% of interaction
437 time), before providing his view. Iain demonstrated individual consideration through this
438 process, conveyed high expectations, and moderate inspirational motivation. He also praised
439 good performances (contingent reward behaviour). The motivational climate was moderately
440 empowering and weakly disempowering, with the stronger dimensions being structure and
441 relatedness support. There was some, albeit weak, evidence of fostering athletes’ autonomy
442 and creating a task-involved environment, however, there was also evidence of controlling
443 and ego-involving dimensions.

444 The athletes (N=4) indicated that Iain engaged in TL behaviours ‘fairly often’
445 (M=4.08, range: contingent reward, M=4.38 to fostering group goals, M=3.75). They

446 recognised his high expectations (M=4.25) for their performances and approach to training
447 (e.g., “try your hardest” and “stay focused”). However, according to Iain, they didn’t always
448 adequately meet his expectations, “what they commit is very spasmodic”. The athletes
449 valued Iain’s “to the point”, “precise” and “technical feedback” and noted that it was positive
450 and encouraging. There appeared to be a reliance on Iain (or another coach) for support (e.g.,
451 Iain or a substitute coach is “always there” at competitions). For Iain, the control of the
452 coaching process resided with the coach. For example, he frequently used terms such as
453 ‘make them’ (e.g., “it’s making him realise what he’s doing”). Furthermore, Iain decided the
454 goals for the observed session and shared these with the athletes. Iain indicated a desire for
455 interaction between coach and athlete to enhance their learning, however, he felt constrained
456 by the time available for sessions and reverted to a more direct style of coaching: “...with
457 time pressure, [its] ‘do this’ and ‘do that’... in that situation I do a lot of telling.”

458 *Coach 3: Andrew*

459 Andrew created an empowering, transformative, not disempowering, motivational
460 climate. There was strong evidence of all four empowering dimensions and several
461 transformational behaviours (i.e., intellectual stimulation and individual consideration).
462 Andrew used the time available for interaction with athletes to engage them cognitively,
463 seeking their input and assessment. He frequently used questions to do this (10.2% of
464 interaction time). There was a clear process in place whereby the athletes expected to have
465 input and solve problems themselves rather than be told. This was evident in the comment of
466 one athlete who, during the session, joked with Andrew saying “you just told me the
467 answer!” The percentage of time athletes were providing input was similar to that of Andrew
468 (30% cf. 29%). Furthermore, two thirds of the time when Andrew provided tactical input it
469 was in response to the athletes’ comments or questions. The coaching climate was a clear

470 translation into practice of Andrew's coaching philosophy, which was illustrated in his
471 comments:

472 "My role is to facilitate the learning process and manipulate the environment to ensure
473 that learning is unavoidable, addictive, fun and long term ... it's identifying those
474 teachable moments... I won't just give them an answer but expect them to go away
475 and come back to me... I want them to learn about themselves a little bit."

476 Andrew's approach was corroborated by the comments of the athletes (N=5). They
477 recognized the importance of a mastery focus and self-analysis (e.g., "I would feedback to the
478 coach, say what I could improve, then [Andrew] would give me some more points if there
479 were any"), and to be able to support themselves in competition (e.g., "[gives] one of the
480 parents a video camera [and] tells us to review our run, just like as if he were there"), and
481 appreciated his individualized coaching (e.g., "coaches you as an individual"). This was also
482 reflected in their perceptions that Andrew engaged in transformational behaviours 'fairly
483 often' (M=4.14) with individual consideration (M=4.85) and intellectual stimulation (M=
484 4.45) displayed almost 'all the time'.

485 *Coach 4: Stewart*

486 Stewart created an empowering, not disempowering, motivational climate. There was
487 strong evidence for all four empowering dimensions. TL behaviours were also evident, in
488 particular, individual consideration and intellectual stimulation. For example, even in a large
489 group of six athletes, Stewart spoke to athletes individually throughout the session and used
490 insightful questioning to support their learning. This interaction encouraged athletes to think
491 and give their views (55.7% of interaction time). This empowering, transformative climate
492 was corroborated by the athletes (N=6) who indicated that Stewart engaged in TL behaviours
493 almost 'all the time' (M=4.81, range= intellectual stimulation, M=4.92, and individual
494 consideration, M=4.85 to role model, M=3.70). Furthermore, they were clear about

495 performance expectations such as being on time and prepared and also being task-involved
496 (e.g., “try my best”, give “100% effort”, and “push myself out of my comfort zone”) during
497 sessions. Supporting this task-involved climate the athletes commented that Stewart was
498 “constructive”, “helps me achieve”, and “helps me with confidence.” They felt he also
499 supported their learning and autonomy, (e.g., he “wants me to improve”, “lets me get on with
500 it”, and “allows me to give things a go”).

501 Stewart’s coaching practices were deliberate and consistent with his philosophy, “I
502 want them to learn for themselves... creating longer-term learning and independent athletes.”
503 He sought to actively engage the athletes in the learning process, commenting that he likes
504 “to get them to do the thinking... figure things out for themselves.” This was achieved
505 through questioning, encouraging autonomous exploration (e.g., “open to experimenting”)
506 and shaping tasks so that they were ‘the teacher’ (e.g., “setting up the environment is so much
507 more important than actually telling them technical things... I set up the gates in a way they
508 know, even before they speak to me how they are doing”).

509 *Coach 5: Cameron*

510 The motivational climate Cameron created was both empowering (i.e., moderate
511 relatedness support and structure) and disempowering (i.e., moderate controlling). Structure
512 was evident in the proportion of time Cameron spent providing course descriptions (24.2%).
513 He considered the individual (TL behaviour, relatedness support) through 1 to 1 feedback
514 following a performance effort, spending more than a third of his time (36.7%) providing
515 coach-initiated tactical input. There was limited athlete input (13.1%). The established
516 process appeared to be that an athlete would complete a performance effort, come to
517 Cameron, and immediately be provided with feedback from him. The athletes’ corroborated
518 this process commenting that Cameron “watches the run and then gives feedback.”

519 The athletes (N=3) indicated that Cameron engaged in TL behaviours ‘fairly often’
520 (M=4.13), they also perceived that contingent reward, a transactional behaviour, occurred
521 almost ‘all the time’ (M=4.92). The athletes were clear that in sessions they should be task-
522 involved (e.g., “try my best”, be “open minded when practicing”) and “take on board advice
523 given”. They recognised and valued Cameron’s expertise commenting that he was
524 “thorough” and had a “good understanding of what I needed to do or change [which] was
525 passed on to me with room for my innovations as well.” There did, however, appear to be a
526 dependence on Cameron to “support my choices” and provide “mental support in order for
527 me to be relaxed and confident.”

528 The individualised approach was confirmed by Cameron who commented that “every
529 paddler is a different person... [I] need to speak [in] different ways with every paddler.” He
530 also suggested he adopted a positive approach with athletes by emphasising “what they did
531 well, rather than what they did not do very well” and recognising the importance of a holistic
532 approach to sport commenting (e.g., “what they learn here in this kind of sport can be [useful]
533 in personal life”). Cameron was also clear that his role was “to lead the athletes to the best
534 way... the coach is one person from many who teaches them [athletes] what to do, how to do
535 it, why to do it – the coach has the biggest impact.” In practice, the process was coach-led.

536 *Coach 6: Simon*

537 Simon created a strong empowering, not disempowering, motivational climate. There
538 was strong evidence of all four empowering dimensions (i.e., autonomy supportive, task-
539 involving, relatedness supportive, and structured). Simon also engaged in several TL
540 behaviours, in particular, individual consideration and intellectual stimulation. An example of
541 how the climate was created was evident in the process Simon had established (structure)
542 whereby after a performance effort athletes came to the him with their thoughts already
543 considered (autonomy support – encouraging input from athletes, intellectual stimulation), a

544 discussion ensued in which the athletes gave their analysis and areas for improvement (task-
545 involved focus, autonomy supportive), Simon asked questions to facilitate learning
546 (intellectual stimulation), provided supportive, positive feedback (relatedness supportive,
547 task-involving) and competition performance-related advice (task-involving). The athlete
548 then engaged in another performance effort. This process was conducted on a one-to one
549 basis (task-involving – individual improvement, individual consideration). Simon’s
550 comments indicated that facilitating this empowering transformative motivational climate
551 was intentional, “I’m trying to get them to lead what is going on... I think it’s all about
552 autonomy, guided autonomy.”

553 Furthermore, and perhaps most importantly, the athletes (N= 3) corroborated the
554 empowering transformational nature of Simon’s coaching climate. They indicated that Simon
555 worked with them and listened to their views (e.g., “hear his views as well as mine to ensure
556 the best race plan”), provided supportive, positive feedback and advice (competition
557 performance-related) with the aim of developing their ability to perform independently (of
558 the coach – if needed) at competitions (e.g., “so that I can work in a group without a coach”).
559 They also felt the coach understood them as individuals considering their well-being and at
560 times a need to build their confidence. These perceptions of the coaching climate were also
561 supported by their perception that Simon ‘almost all the time’ engaged in TL behaviours
562 (M=4.65, range= individual consideration, M=4.83, to intellectual stimulation, M=4.33).

563 Stage 2: Comparison of talent development coaching climate profiles

564 All the coaches were recognised by the national governing body as effective coaches
565 in producing athletes who were capable of moving up the performance pathway (and had). It
566 was evident, however, from the analysis of the talent development coaching climates that the
567 way the coaches worked with athletes was not uniform. There were a number of common
568 features amongst the coach-created climates. First, their coaching had clear organisation and

569 structure, a feature of a task-involving motivational climate. Goals for sessions were shared
570 and athletes understood the coach's expectations and the processes used within the session
571 (e.g., briefing, performance effort, interaction with coach, subsequent performance effort).
572 Second, they all adopted an individualised, task-involved approach by considering the
573 individual's needs (at the very least the technical/tactical needs) and focusing on assisting
574 each individual to improve his or her performance. Third, all the coaches also connected with
575 the athletes through their performance and non-performance related conversations, which
576 fostered relatedness support and a generally positive social psychological environment. There
577 were, however, also differences in how the coaches worked with athletes. In particular, the
578 coaches differed in the extent to which they created a climate that supported athletes'
579 autonomy and fostered intellectual stimulation.

580 Using the framework proposed by Nelson and Colquhoun (2013), we analysed the
581 talent development coaching climates these coaches created, and why, to further explore the
582 differences in their coaching approaches. Specifically, we examined the data and summary
583 profiles for evidence of behaviourist, humanistic, structure, and agency perspectives on
584 learning and coaching. Each coach-created TD coaching climate was then 'mapped' in
585 relation to these perspectives to provide a visual representation (Figure 1). This process
586 revealed two relatively distinct clusters of coaching climates: 1) Predominantly coach-driven
587 approaches characterized by a more behaviourist and structured view of learning and
588 coaching; 2) Approaches to coaching characterized by an emphasis on humanistic and agency
589 views of learning and coaching.

590 The climates created by James, Iain, and Cameron emphasized a more behaviouristic
591 view of learning. These coaches spent a greater proportion of their interaction time with
592 athletes providing tactical input. James and Cameron, in particular, provided feedback with
593 only limited engagement with, or input from the athletes. Cameron's athletes also reported

594 that he engaged in contingent reward behaviour (a transactional behaviour) almost ‘all the
595 time’. Observations of these three coaches demonstrated weak evidence of an empowering
596 motivational climate, with structure and relatedness support dimensions being the main
597 components of the climate. There was also some evidence of a weak disempowering climate
598 through controlling and ego-involving dimensions.

599 There were, however, differences amongst the three coaches with regard to the
600 structure-agency view of learning. James’ desire to ‘make a difference’, focusing on what he
601 will do, along with high expectations positioned James more towards structure than agency.
602 There was some suggestion that he at least recognized the importance of agency (e.g., he
603 indicated a desire to understand the athletes’ perspective), however, this was not evident in
604 his practice or the athletes’ perceptions. Iain demonstrated a balance between structure of the
605 coaching episode and an individual’s agency. This was seen in his practice where he used a
606 questioning style to promote athlete learning but with an exacting technical model that he
607 wanted the athletes to achieve. Cameron’s observed and perceived coaching climate was also
608 clearly positioned towards a behaviourist view of learning, however, his philosophy and
609 discussion positioned him towards an agency rather than structured view. This revealed a
610 potential mismatch for Cameron between what he believed was effective and what he was
611 able to put into practice. This may be in part a result of pressure due to the limited time
612 available ‘on the water’ as a result of coaching at an artificial course.

613 In contrast, the climates created by Simon, Andrew, and Stewart portrayed clear
614 humanistic and agency views of learning and coaching. Similar to James, Iain, and Cameron,
615 they fostered elements of an empowering climate through structure and relatedness support. It
616 was, however, the facilitation of task-involvement, autonomy support, intellectual stimulation
617 and a lack of disempowering dimensions that set them apart from the other 3 coaches and
618 positioned them as more humanistic in their approach. A translation of this approach into

619 practice was the deliberate effort to cognitively engage the athletes. This was achieved
620 through the use of questioning and also task design to supportively challenge athletes to
621 ‘figure things out for themselves’. The coaches also sought to assist athletes to become
622 independent, autonomous performers, a central feature of a humanistic approach. Simon’s
623 climate was intentionally empowering. His support for autonomy and freedom for athletes to
624 express themselves aligned Simon with an agency view of learning. Stewart, like Simon,
625 fostered athletes’ agency from a strongly humanistic stance (relatedness support, task-
626 involved, autonomy support), which was consistent with his philosophy and practice.
627 Andrew’s use of a questioning style, emphasising athletes’ autonomy over their performance,
628 was a translation of his philosophy into practice. In comparison to Simon and Stewart, whilst
629 Andrew still allowed for elements of athlete agency, his climate was more structured.

630 Discussion

631 The purpose of this study was to extend our understanding of the TDE, in particular
632 the athlete-coach micro level, by adopting a theoretically-based multidimensional view of the
633 coach-created motivational climate. Employing multiple perspectives and methods enabled
634 an in depth examination of what coaches do, why, and how athletes’ perceive the climate and
635 coaching behaviours in canoe slalom TDEs in the UK. Our findings contribute to TDE and
636 coaching knowledge in several ways. First, the commonalities amongst coaches’ practices are
637 consistent with TDE research but also demonstrate that the coaches created motivationally
638 adaptive climates. Second, despite commonalities there were also differences in the
639 motivational climates created. Analysis of what the coaches did and why, from a learning
640 perspective, provided an explanation for these differences. Third, adopting multiple
641 perspectives and methods proved useful in identifying both congruence and disparity within
642 the motivational climates. Fourth, the findings demonstrate the complementary nature of the

643 three approaches (AGT, SDT, TL) employed to analyse the motivational climate and the
644 additional insight that can be gained.

645 To date, the exploration and analysis of the TDE has been holistic and largely
646 descriptive with the identification of a wide range of factors that affect talent development
647 (Coutinho, et al., 2016). By employing a theoretically-based motivational climate approach
648 we were able to provide a more detailed analysis of the interactions between coaches and
649 athletes. This analysis demonstrated common practices amongst the coaches that were not
650 only consistent with TDE research (Henriksen, et al., 2011; Martindale et al., 2007; Mills et
651 al., 2012), research of successful high performance coaches (Lara-Bercial & Mallett, 2016)
652 but also consistent with motivationally adaptive climates. The coaches all created a more
653 empowering and less disempowering climate, which is consistent with the International Sport
654 Coaching Framework (ICCE, 2013), findings from Smith et al.'s (2016) large scale study of
655 youth sport coaches, and associated with motivationally adaptive outcomes for participants
656 (e.g., Gilchrist & Mallett, 2017; Harwood, et al., 2015; Occhino et al., 2014). In addition,
657 respondents in the current study indicated that coaches exhibited transformational leadership
658 behaviours which have also been associated with desired outcomes for participants (e.g.,
659 Callow et al., 2009). As such, theory and research suggest that an empowering and
660 transformational climate, similar to those exhibited by the coaches in this study, would be
661 expected to satisfy basic psychological needs and in turn lead to self-determined behavioural
662 regulation and even superior performance in TDEs.

663 It would be inappropriate to claim that a causal relationship exists between the coach-
664 created climates in the current study and the success these coaches have had in developing
665 athletes that progress along the talent pathway, however, there are many similarities between
666 these coaches' behaviours and those of serial winning high performance coaches (Lara-
667 Bercial & Mallett, 2016). [For example, the coaches had a clear philosophy that provided](#)

668 purpose and direction to their coaching. Detailed planning resulted in structured sessions and
669 individualised their approach. They conveyed high expectations (TL), considered individual
670 needs (AGT/SDT/TL), and to varying extents the coaches focused on process over results
671 (fostered a task-involved focus - AGT/SDT). All but one of the coaches built strong
672 relationships with athletes (supported relatedness - SDT) and three of the coaches shared
673 decision making and fostered self-awareness and self-reliance (supported autonomy – SDT,
674 fostered intellectual stimulation - TL). Therefore, this study does suggest practices that other
675 coaches and key stakeholders may wish to consider when working in TDEs.

676 An example of how this ‘productive’ motivational climate was achieved by several
677 coaches was through well-developed performance-analysis-discussion-performance
678 ‘routines’ established with their athletes that encouraged athletes to consider their own
679 performance and how they might improve it before discussing this with the coach. If needed,
680 the coach would provide feedback or, more often, ask a question to help athletes to ‘discover’
681 or decide what they could do to improve and then encourage them to ‘try it and see’. All the
682 while encouraging individually-referenced performance. By listening to the athletes’ analysis
683 of their performance, encouraging them to work through a ‘problem’ or task, providing input
684 only when needed, they built a training environment in which athletes felt ‘supported and
685 safe’ to challenge themselves. The structure and emphasis on task-involvement helps athletes
686 to develop their actual and perceived competence. Furthermore, acknowledging their
687 perspectives and encouraging initiative tasking supports athletes’ autonomy and provides
688 intellectual stimulation. This individualised approach and listening to athletes fosters a sense
689 of relatedness and individual consideration. Although structure may seem at odds with
690 providing support for autonomy, research in education has demonstrated that when clear
691 objectives are combined with autonomy supportive behaviours, structure can lead to adaptive

692 outcomes for participants (Jang, Reeve, & Deci, 2010; Vansteenkiste et al., 2012; Reeve,
693 2002).

694 During the coaching sessions, all athletes gained insight into how to improve their
695 performance, however, how this insight was gained was notably different amongst the
696 coaches and influenced the climate created. Several coaches were more overt and direct in
697 their provision of input to assist athletes to improve (e.g., James, Iain), whilst others used
698 practices such as questions, conversations, and manipulation of the tasks to guide and
699 encourage athletes to analyse their performance and ‘discover’ feedback to improve their
700 performance (e.g., Simon, Stewart, Andrew). These practices resulted in the coaches differing
701 in their support for autonomy (SDT) and intellectual stimulation (TL). This finding is
702 somewhat in contrast to TDE research which generally suggests that coaches consider
703 athletes’ ownership and self-responsibility (autonomy) as critical to successful talent
704 development (e.g., Martindale, et al., 2007; Mills et al., 2014a; 2014b).

705 An explanation for the difference in how athletes gained insight about their
706 performance was evident in the clear connection between the coaches espoused and enacted
707 view of athletes’ learning and their coaching practice. For all but one of the coaches,
708 differences in their coaching practice could be explained by their espoused philosophy of
709 coaching. Others have also recognized this link between philosophy and practice (e.g.,
710 Barnson, 2014; ICCE, 2013; Lara-Bercial & Mallett, 2016). For example, Barnson concluded
711 that “coaching is defined as the process of utilising an intentional philosophic approach”
712 (2014, p. 73). Coaches’ philosophies have been subject to research attention (e.g., Bennie &
713 O’Connor, 2010; Nash, Sproule, & Horton, 2008), however, to our knowledge this is the first
714 study to examine the congruency between philosophy and practice in relation to the climate.

715 Using Nelson and Colquhoun’s (2013) framework we were able to analyse the
716 coaches’ perspectives on athletes’ learning along behaviourist/humanistic and

717 structure/agency continuums. In doing so, we were able to gain understanding of why they
718 coached as they did. Those coaches positioned towards the humanistic and agency ends of the
719 continuums emphasised knowledge production, rather than knowledge transmission. Such
720 views of coaching are consistent with Kirk's (2010) contemporary educational practice view
721 of coaching. Developing this understanding not only helps to explain the practices of these
722 coaches but also provides avenues for development of coaches. When reflecting on how to
723 develop TDEs, coaches and other key stakeholders (sport organisations, coach developers,
724 athletes, parents) might consider why certain practices and climates are being promoted
725 (perhaps over others) and consider what perspective on learning is being privileged.
726 Understanding these underlying beliefs and values can raise awareness and provide
727 opportunities to 'check and challenge' practices and structures. For example, the International
728 Sport Coaching Framework (ICCE, 2013) and a recent US Olympic Committee coach
729 development programme (Ferrar, et al., 2018) both emphasise the importance of developing
730 coaches' intrapersonal knowledge.

731 It has been argued elsewhere (Coutinho, et al., 2016) that there may be differences
732 between what coaches' *say* is critical for talent development (e.g., Martindale, et al., 2007;
733 Mills et al., 2014b), what they actually *do* (Henriksen, et al., 2010a), and what is perceived by
734 athletes (Mills, et al., 2014a). Therefore, we employed multiple perspectives and methods to
735 provide an in-depth understanding of the same TDE. Our findings are somewhat in contrast
736 to this argument, suggesting congruence rather than disparity amongst perspectives. An
737 exception for this, however, was the disparity identified between one coach's (Cameron)
738 espoused philosophy and actual practice. This disparity may have arisen for several reasons.
739 Cameron was the youngest of the coaches, had the least amount of coaching experience, and
740 time coaching in the TDE. Although, we are not suggesting he is a novice coach, research has
741 demonstrated differences between expert and novice coaches in their ability to express their

742 coaching philosophy (Nash et al., 2008). Cameron was also observed during a session on
743 artificial water which has time constraints that are not evident when coaching on a natural
744 river. The added pressure of limited time may have contributed to his more coach-led
745 approach (Mageau & Vallerand, 2003).

746 This study was the first, to our knowledge, to empirically examine the coach-created
747 talent development motivational climate using a theoretically-based multidimensional
748 approach. Others have integrated AGT and SDT (Allen & Hodge, 2006; Duda, 2013; Mallett
749 & Hanrahan, 2004) or SDT and TL (Stenling & Tafvelin, 2014) and Vella and Perlman
750 (2014) have proposed commonalities amongst all three at the behaviour level. This is the first
751 study, however, to use all three approaches to develop a detailed understanding of the
752 motivational climate. Although AGT, SDT, and TL have differences conceptually, all three
753 promote essentially a growth-oriented process focused on inspiring and empowering others to
754 excel. Each provide a focus on the situational factors (i.e., specific coaching behaviours) that
755 influence athletes' experiences in sport (Ames, 1992; Mageau & Vallerand, 2003; Callow et
756 al., 2009). By employing all three approaches, we were able to provide a more complete
757 examination of the coaching interactions that shape the motivational climate in TDEs within
758 Canoe Slalom in the UK.

759 Limitations and future directions

760 No study is without limitations and the current study is no exception. We explored the
761 perspectives of only a small number of coaches and athletes in one sport, Canoe Slalom, in
762 one country, the UK. Even though our sample comprised two-thirds of the coaches who are
763 employed full-time within the talent development pathway for this sport, caution should be
764 taken in applying these findings to other TDEs, sports, and countries. Researchers should
765 continue to explore, in detail, the factors of successful and less successful TDEs, including
766 the coach-created climate, to further our understanding of how coaches and other key

767 stakeholders might facilitate talent development. Our study included only one female coach.
768 Where researchers have provided the gender of coaches working in TDEs very few have been
769 women. For example, Martindale et al. (2007) had 2 women coaches out of the 16 coaches in
770 their study. Mills et al. (2014b) did not give the gender of the coaches in their study,
771 however, given that the focus was male academy football one might assume that all the
772 coaches were men. Despite recognition of the benefits of women as coaches (UK Coaching,
773 2015), they are underrepresented in performance sport (Norman, 2017). Further research
774 should seek to examine the climate created by female coaches as well as male coaches.
775 Adopting multiple methods and perspectives to capture the motivational climate was a
776 strength of this study, however, we only observed the coaches during one training session.
777 The context of a particular training session (e.g., session goals, events in previous sessions,
778 stage of the training cycle) may, and arguably should, influence the coach's behaviours.
779 Therefore, this may raise a question regarding how representative the observed session was of
780 the coaches' 'normal' coaching behaviours and motivational climate. The sessions were all at
781 the same point in the training cycle (i.e., 2-3 days prior to an important competition), athletes
782 were asked directly, and indicated that the session was reflective of a 'normal' session. Future
783 research, however, should consider how many observations are necessary to provide accurate
784 and representative data for their intended purpose. Furthermore, we did not measure
785 perceptions of the empowering/disempowering climate through quantitative means as others
786 have done (e.g., Smith et al, 2016), rather we assessed this through open-ended questions, the
787 coaches' interviews, and observations. Both methods provide useful insight into participants'
788 perceptions of the motivational climate, therefore future research should consider the
789 application of both methods, along with recognition of the strengths and limitations of each,
790 to further develop our understanding of the motivational climate in TDEs.

791 Conclusion

792 Adopting a theoretically-based multidimensional approach we examined the central
793 feature of TDEs at the micro level – the interactions between coaches and athletes and the
794 motivational climate created. The coaches all created a more empowering and less
795 disempowering talent development motivational climate, however, the extent to which the
796 coaches’ fostered autonomy support and intellectual stimulation differed. This notable
797 difference in coaching practice could be explained by the coaches’ philosophy of coaching, in
798 particular their views on athletes’ learning. Therefore, those working with or responsible for
799 athletes in TDEs may benefit from examination of, not only, coaches’ interactions with
800 athletes but also concepts such as the motivational climate and coaches’ beliefs about how
801 learning happens. The workshop of Turnnidge & Côté (2017) may provide a useful starting
802 point for development this area. This could involve exploring and reflecting on coaches’
803 philosophies of coaching, understanding of the motivational climate, and how (and perhaps
804 under what conditions) they do or do not translate knowledge and beliefs into actual coaching
805 practice.

806 References

- 807 Allen, J. B., & Hodge, K. (2006). Fostering a learning environment: Coaches and the
808 motivational climate. *International Journal of Sports Science & Coaching*, 1, 261-277.
- 809 Ames, C. (1992). Achievement goals, motivational climate, and motivational processes. In
810 G.C. Roberts (Ed.) *Advances in Motivation in Sport and Exercise* (pp. 161-176).
811 Champaign, IL: Human Kinetics.
- 812 Barnson, S.C. (2014). *The authentic coaching model: A grounded theory of coaching*.
813 *International Sport Coaching Journal*, 1, 61-74.
- 814 Bass, M. B. & Riggio, E. G. (2006). *Transformational Leadership* (2nd ed.). Mahwah, NJ:
815 Lawrence Erlbaum Associates.

816 Bennie, A. and O'Connor, D. (2010). Coaching philosophies: Perceptions from professional
817 cricket, rugby league and rugby union players and coaches in Australia. *International*
818 *Journal of Sports Science and Coaching*, 6 (2), 309-320.

819 Callow, N., Smith, M.J., Hardy, L., Arthur, C.A., & Hardy, J. (2009). Measurement of
820 transformational leadership and it's relationship with team cohesion and performance
821 level. *Journal of Applied Sport Psychology*, 21, 395-412.

822 Côté, J., Lidor, R., & Hackfort, D. (2009). To sample or to specialize? Seven postulates about
823 youth sport activities that lead to continued participation and elite performance.
824 *International Journal of Sport and Exercise Psychology*, 7, 7-17.

825 Coutinho, P., Mesquita, I. & Fonseca, A. (2016). Talent development in sport: A critical
826 review of pathways to expert performance. *International Journal of Sports Science &*
827 *Coaching*, 11(2), 279-293.

828 Cresswell, J. W. & Miller, D. L. (2000). Determining validity in qualitative inquiry. *Theory*
829 *in Practice*, 39 (3), 124-130.

830 Cushion, C. (2010). Coach behaviour. In J. Lyle and C. Cushion (Eds.), *Sports coaching:*
831 *Professionalisation and practice* (pp. 43-61). London: Elsevier.

832 Duda, J.L. (2013). The conceptual and empirical foundations of Empowering Coaching™:
833 Setting the stage for the PAPA project'. *International Journal of Sport and Exercise*
834 *Psychology*, 11, 311-318. DOI: 10.1080/1612197X.2013.839414

835 Ferrar, P., Hosea, L., Henson, M., Dubina, N., Krueger, G., Staff, J., & Gilbert, W. (2018).
836 Building high performing coach-athlete relationships: The USOC's National Team
837 Coach Leadership Education Program (NTCLEP). *International Sport Coaching*
838 *Journal*, 5, 60-70 <https://doi.org/10.1123/iscj.2017-0102>

839 Gilchrist, M. & Mallett, C. J. (2017). The theory (SDT) behind effective coaching. In R.
840 Thelwell, C. Harwood, I. Greenless (Eds.) *The Psychology of Coaching*. London:
841 Routledge.

842 Gould, D., Guinan, D., Greenleaf, C., Medbery, R., & Peterson, K. (1999). Factors affecting
843 Olympic performance: Perceptions of athletes and coaches from more and less
844 successful teams. *The Sport Psychologist*, *13*, 371-394.

845 Harwood, C. G., Keegan, R. J., Smith, J. M. J., & Raine, A. S. (2015). A systematic review
846 of the intrapersonal correlates of motivational climate perceptions in sport and
847 physical activity. *Psychology of Sport & Exercise*, *18*, 9-28.

848 Henriksen, K., Stambulova, N., & Roessler, K.K. (2010a). A holistic approach to
849 athletic talent development environments: A successful sailing milieu. *Psychology of*
850 *Sport and Exercise*, *11*, 212–222.

851 Henriksen, K., Stambulova, N., & Roessler, K.K. (2010b). Successful talent development in
852 track and field: Considering the role of environment. *Scandinavian Journal of*
853 *Medicine & Science in Sports*, *20*, 122–132.

854 Henriksen, K., Stambulova, N., & Roessler, K. K. (2011). Riding the wave of an expert: A
855 successful talent development environment in kayaking. *The Sport Psychologist*,
856 *25*(3), 342-362.

857 International Council for Coaching Excellence. (2013). International Sport Coaching
858 Framework. Champaign, IL: Human Kinetics

859 Jang, H., Reeve, J., & Deci, E. L. (2010). Engaging students in learning activities: It is not
860 autonomy support or structure but autonomy support and structure. *Journal of*
861 *Educational Psychology*, *102*, 588-600.

862 Kirk, D. (2010). Towards a socio-pedagogy of sports coaching. In J. Lyle and C. Cushion
863 (Eds.), *Sports coaching: Professionalisation and practice* (pp.165-176). London:
864 Elsevier.

865 Kirkpatrick, S., & Locke, E. (1996). Direct and indirect effects of three core charismatic
866 leadership components on performance and attitudes. *Journal of Applied Psychology*,
867 *81*, 36-51.

868 Lara-Bercial, S. & Mallett, C. J. (2016). The practices and developmental pathways of
869 professional and Olympic serial winning coaches. *International Sport Coaching*
870 *Journal*, *3*, 221 -239 <http://dx.doi.org/10.1123/iscj.2016-0083>

871 Mallett, C. J. & Hanrahan, S. J. (2004). Elite athletes: why does the ‘fire’ burn so brightly?
872 *Psychology of Sport and Exercise*, *5*, 183–200.

873 Mallett, C. J. (2005). Self-determination theory: a case study of evidence-based coaching.
874 *The Sport Psychologist*, *19*, 417-429.

875 Martindale, R., Collins, D., & Daubney, J. (2005). Talent development: A guide for practice
876 and research within sport. *Quest*, *57*, 353-375.

877 Martindale, R., Collins, D., & Abraham, A. (2007). Effective talent development: The elite
878 coach perspective in UK sport. *Journal of Applied Sport Psychology*, *19*, 187–206.

879 Martindale, R., Collins, D., Douglas, C. & Whike, A. (2012). Examining the ecological
880 validity of the Talent Development Environment Questionnaire, *Journal of Sports*
881 *Sciences*, *31*, 41–47.

882 Mills, A., Butt, J., Maynard, I., & Harwood, C. (2012). Identifying factors perceived to
883 influence the development of elite football academy players in England. *Journal of*
884 *Sports Sciences*, *30*, 1593–1604. doi:10.1080/02640414.2012.710753

885 Mills, A., Butt, J., Maynard, I., & Harwood, C. (2014a). Examining the development
886 environments of elite English football academies: The players' perspective.
887 *International Journal of Sports Science & Coaching*, 9, 1457-1472.

888 Mills, A., Butt, J., Maynard, I., & Harwood, C. (2014b). Toward an understanding of optimal
889 development environments within elite English soccer academies. *The Sport*
890 *Psychologist*, 28, 137-150.

891 Mageau, G. A., & Vallerand, R. J. (2003). The coach-athlete relationship: A motivational
892 model. *Journal of Sports Sciences*, 21, 883-904.

893 Morgan, G., Muir, B., & Abraham, A. (2014). Systematic Observation. In L. Nelson, R.
894 Groom, & P. Potrac (Eds.) *Research Methods in Sports Coaching*, (pp. 126-133).
895 London: Routledge.

896 Morgan, K. (2017). Reconceptualising motivational climate in physical education and sport
897 coaching: An interdisciplinary perspective, *Quest*, 69(1), 95-112.

898 Nash, C., Sproule, J., & Horton, P. (2008). Sport coaches' perceived role frames and
899 philosophies. *International Journal of Sports Science & Coaching*, 3(4), 539-554.

900 Nelson, L. & Colquhoun, D. (2013). Athlete (non) learning. In P. Potrac, W. Gilbert, & J.
901 Denison, (Eds.) *Routledge Handbook of Sports Coaching* (pp. 284-295). London:
902 Routledge.

903 Nicholls, J. G. (1989). *The competitive ethos and democratic education*. Cambridge, MA:
904 Harvard University Press.

905 Norman, L. (2017). *Presenting the 2016 Rio Olympics gender and coaching report card:*
906 *What's changed since London?* ICCE Global Coaching Conference, July 31 - August
907 2, 2017, Liverpool.

908 Occhino, J. L., Mallett, C. J., Rynne, S. B., & Carlisle, K. N. (2014). Autonomy-supportive
909 pedagogical approach to sports coaching: Research, challenges and opportunities.
910 *International Journal of Sports Science & Coaching*, 9 (2), 401-417.

911 Patton, M.Q. (2002). *Qualitative research and evaluation methods* (3rd ed.). Thousand Oaks,
912 CA: Sage.

913 Pensgaard, A-M., & Roberts, G.C. (2002). Elite athletes' experiences of the motivational
914 climate: The coach matters. *Scandinavian Journal of Medicine & Science in Sports*, 12,
915 54-59.

916 Ryan, R.M., & Deci, E. L. (2000). Self-Determination theory and the facilitation of intrinsic
917 motivation. *American Psychologist*, 55, 68-78.

918 Smith, B., (2010). Narrative inquiry: ongoing conversations and questions for sport and
919 exercise psychology research, *International Review of Sport and Exercise Psychology*,
920 3 (1), 87-107.

921 Smith, N., Tessier, D., Tzioumakis, Y., Fabra, P., Quested, E., Appleton, P., Sarrazin, P.,
922 Papaioannou, A., Balaguer, I., & Duda, J. L. (2016). The relationship between observed
923 and perceived assessments of the coach-created motivational environment and links to
924 athlete motivation. *Psychology of Sport and Exercise* 23, 51-63.

925 Smith, N., Tessier, D., Tzioumakis, Y., Quested, E., Appleton, P., Sarrazin, P., Papaioannou,
926 A. & Duda, J.L. (2015). Development and validation of the Multidimensional
927 Motivational Climate Observation System. *Journal of Sport & Exercise Psychology*,
928 37, 4-22.

929 Smith, R.E., Smoll, F.L., & Cumming, S.P. (2007). Effects of a motivational climate
930 intervention for coaches on young athletes' sport performance anxiety. *Journal of Sport
931 and Exercise Psychology*, 29, 39-59.

932 Stenling, A., & Tafvelin, S. (2014). Transformational leadership and well-being in sports:
933 The mediating role of need satisfaction, *Journal of Applied Sport Psychology*, 26(2),
934 182-196.

935 Trollope, K. (2015). *British Canoeing Slalom Yearbook 2015*. British Canoeing Slalom
936 Committee.

937 Turnnidge, J. & Côté, J. (2017). Transformational coaching workshop: applying a person-
938 centred approach to coach development programs. *International Sport Coaching*
939 *Journal*, 4, 314-325. <https://doi.org/10.1123/iscj.2017-0046>

940 UK Coaching (2015). Briefing note - The case for gender equality in coaching. Available at
941 <http://www.ukcoaching.org/resource/gender-equality-coaching-briefing-note>

942 Vansteenkiste, M., Sierens, E., Goossens, L., Soenens, B., Dochy, F., Mouratidis, A.,
943 Aelterman, N., Haerens, L., & Beyers, W. (2012). Identifying configurations of
944 perceived teacher autonomy support and structure: Associations with self-regulated
945 learning, motivation and problem behavior. *Learning and Instruction*, 22(6), 431-439.

946 Vella, S. A. & Perlman, D. J. (2014). Mastery, autonomy and transformational approaches to
947 coaching: Common features and applications. *International Sport Coaching Journal*, 1
948 (3), 173-179.

949 Table 1. Overview of data collection methods, purpose, and data generated.

Method	Purpose	How data were collected	Data generated
<i>Athletes' Perspectives</i>			
Questionnaire Part A: Differentiated Transformational Leadership Inventory (DTLI) (Callow, et al., 2009)	To assess athletes' perceptions of the coach's TL behaviours	Athletes were asked to complete the DTLI within 1 hour of their session and	N=24 Completed questionnaires
Questionnaire Part B: Open-ended questions	To assess athletes' perceptions of the session and the coach's empowerment and TL behaviours, including how representative the session of 'normal' coaching.	to make their reflections with reference to that specific session	
<i>Coaches' Perspectives</i>			
Semi-structured interview	To gain the coaches' perceptions of the session, their coaching practices, and underlying philosophy	Coaches were interviewed within 24 hours of the session. Interviews were recorded and then transcribed	N= 70 minutes of recording N=33 pages of transcription Average transcription length was 5.5 pages.
Coach philosophy question: 'what is your primary aim when coaching junior athletes?' (in other	To understand the coaches' individual coaching philosophy	After the observed coaching session and interview, coaches were contacted and asked to provide a written response to the	N=6 short paragraphs Philosophy length range was 10 to 110 words Average length was 54 words

words, what is your philosophy as expressed in your coaching role?)’

Observers’ Perspectives

Systematic observation Part A:

Coaching interactions

To examine the proportion of the session involving athlete-coach interaction and the type of interactions

emailed question about their coaching philosophy

Video analysis of session utilising a bespoke observation tool

Systematic observation Part B:

Multidimensional Motivational Climate Observation System (MMCOS) (Smith, et al., 2015)

To examine the empowering and disempowering motivational climate in the coaching session

Video analysis of session using the MMCOS

N=6 observed and recorded sessions
N=380 minutes of observation
Session length range 50 to 108 minutes
Each session was analysed 3 times

Systematic observation Part C:

Transformational leadership behaviours

To examine the transformational leadership behaviours in the coaching session

Video analysis of session using a bespoke TL behavior observation tool based on DTLI behaviours (Callow, et al., 2009)

951 Table 2. Proportion of time and type of coach-athlete interactions

	James	Iain	Andrew	Stewart	Cameron
Observing / recording time (mins)	49.5	95.3	64.0	108.0	62.8
Athletes in session	3	4	5	6	3
<i>Percentage of coach interaction time by session</i>					
Coach-athlete interaction time	44.3	30.1	42.5	34.2	28.0
Coaching interaction time per athlete*	14.8	7.5	8.5	5.7	9.3
<i>Percentage of coach interaction time by type</i>					
Coach extrinsic feedback (KP)	5.9	6.0	5.7	0.8	6.5
Interactive (e.g., discussion, social chat)	12.0	9.6	17.0	10.8	13.2
Extrinsic tactical input	44.5	13.7	9.3	4.8	36.7
Tactical input in response	5.5	38.2	19.6	9.1	2.8
Coach question to open conversation	1.1	1.3	4.9	3.4	0.7
Coach question to develop understanding	0.8	1.5	4.3	7.5	2.7
Athlete input	4.9	20.1	30.0	55.7	13.1
Course description	25.4	9.5	9.2	7.8	24.2

952 * Calculated by total coach-interaction time divided by number of athletes in the session

953 Note. Specific figures are not available for Simon due to video recording failure

954

955

956 Table 3. Observed strength of multidimensional motivational climate.

Climate Dimension	James	Iain	Andrew	Stewart	Cameron	Simon
Autonomy supportive	0	1	3	3	1	3
Task involving	1	1	3	3	1	3
Relatedness supportive	1	2	3	3	2	3
Structured	2	2	3	3	2	3
<i>Empowering mean</i>	<i>1</i>	<i>1.5</i>	<i>3</i>	<i>3</i>	<i>1.5</i>	<i>3</i>
Controlling	1	1	1	0	2	0
Ego involving	1	1	0	0	1	0
Relatedness thwarting	0	0	0	0	1	0
<i>Disempowering mean</i>	<i>0.7</i>	<i>0.7</i>	<i>0.3</i>	<i>0.0</i>	<i>1.3</i>	<i>0.0</i>

957 Note. Potency rating scale is 0 (not at all), 1 (weak), 2 (moderate), 3 (strong).

958

959 Table 4. Athletes' and observers' perceptions of transformational leadership behaviours

	James	Iain	Andrew	Stewart	Cameron	Simon
Individual consideration	4.33 / 3	3.94 / 3	4.85 / 3	4.75 / 3	4.50 / 3	4.83 / 3
Inspirational motivation	4.33 / 0	4.38 / 1	4.25 / 3	4.83 / 2	3.92 / 0	4.67 / 3
Intellectual stimulation	4.08 / 0	4.06 / 2	4.45 / 3	4.92 / 3	4.08 / 1	4.33 / 3
Role model	3.33 / 1	3.81 / 1.5	3.70 / 2	4.71 / 2	3.67 / 1.5	4.83 / 2
High performance expectations	3.75 / 1	4.25 / 2	4.20 / 2	4.83 / 1	3.75 / 1	4.58 / 2
Contingent reward	3.75 / 2	4.38 / 3	4.00 / 2	4.83 / 2	4.92 / 1	4.75 / 2
Group goal acceptance	4.11 / 1	3.75 / 0	3.53 / 1	4.78 / 1.5	4.11 / 1	4.56 / 1
Mean	3.96 / 1.1	4.08 / 1.8	4.14 / 2.3	4.81 / 2.1	4.13 / 1.2	4.65 / 2.3

960 Scores are presented athlete's perceptions / observers' rating. Athletes' perceptions are scored
 961 on a 5 point scale (1 = not at all, 5 = all the time). Observers' ratings are scored on the
 962 potency rating scale 0 (not at all), 1 (weak), 2 (moderate), 3 (strong).

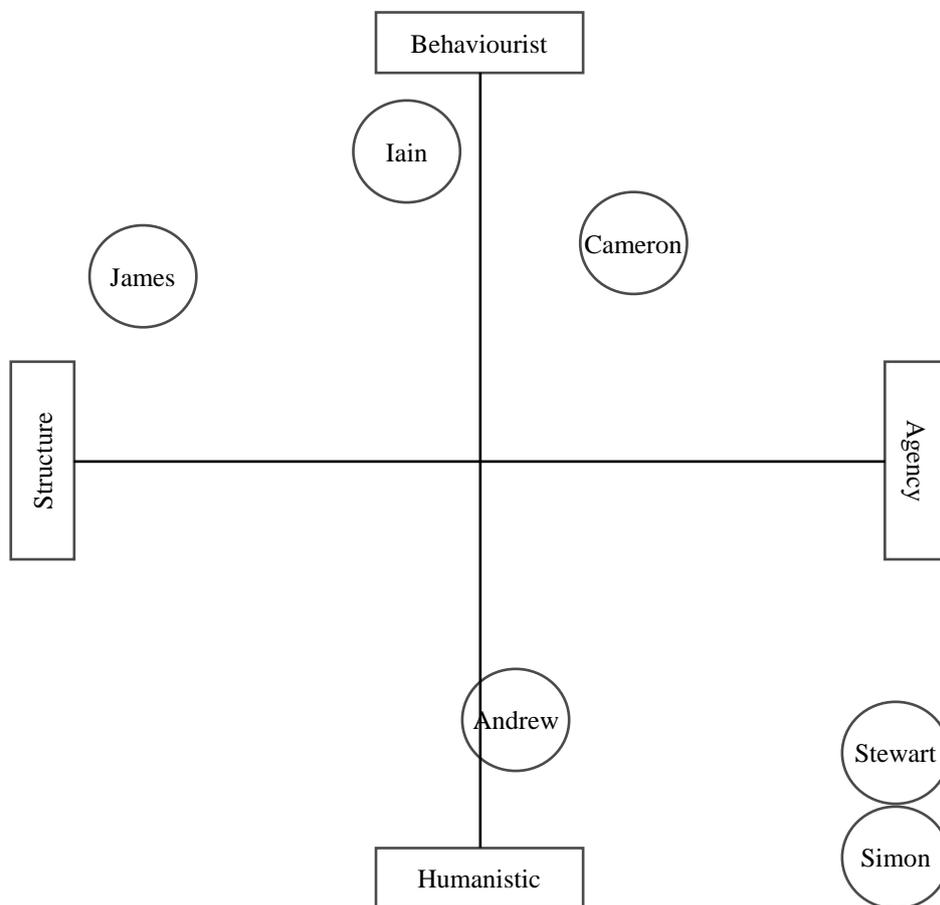
963

964

965 Figure 1. Coaches' TD motivational climate mapped onto perspectives of learning

966

967



968

969 Appendix A. Coaches' interview questions

970 Did the session run as anticipated?

971 What were your aims for the session?

972 How well were those aims achieved?

973 How do you encourage interest and enquiry on the part of your athletes?

974 Do you, if so how and why, provide rationale to athletes for the tasks you set?

975 How important is providing structure to the environment you create?

976 How do you encourage athletes taking initiative?

977 How do you provide reward for your athletes and what do you reward?

978 How would you describe your communication style and how is this manifest to your athletes

979 (ie what would they see / hear)?

980 How does this last session fit with your overall plan for these athletes?

981

982 Appendix B. Athletes' questionnaire open-ended questions

983 How similar or different was this session to previous sessions you have had this year?

984 How would you describe the way your coach coached you on this session?

985 Does your coach explain why they are asking you to do certain drills / exercises? If yes, do
986 you think this is important and why?

987 How does your coach encourage or reward you?

988 In what ways does your coach encourage you to understand why certain techniques work?

989 What do you need from your coach in the run up to a competition?

990 How does your coach prepare you for times when he/she can't be with you at an event?