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Running Head: COACHING CLIMATES AND BURNOUT IN SCHOOL AND SPORTS

Relationship between Coaching Climates and Student-Athletes' Symptoms of Burnout  
in School and Sports

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Running Head: COACHING CLIMATES AND BURNOUT IN SCHOOL AND SPORTS

Relationship between Coaching Climates and Student-Athletes'

Symptoms of Burnout in School and Sports

### **Abstract**

The purpose of the present study was to investigate (1) what kind of coaching climates experienced by student-athletes can be found in sports high schools in Finland and (2) how these coaching climates are related to student-athletes' symptoms of burnout in sports and in school. A total of 414 student-athletes, aged 17–18, from seven sports high schools participated in this study. In addition to background information, the participants completed questionnaires concerning the perceived coaching climate and symptoms of burnout in both school and sports environments. By using latent profile analysis, four groups of experienced coaching climates were identified: extremely disempowering, disempowering, empowering, and intermediate. Student-athletes in the extremely disempowering and disempowering coaching climate groups reported higher levels of sport burnout than student-athletes in the other two groups. Moreover, they reported higher levels of school burnout than student-athletes in the empowering group. Overall, these findings offer timely insights into the ways high school coaches may play a role in student-athletes' burnout not only within but also across the domains of sports and school.

*Keywords:* coaching, sport and school burnout, dual career, youth sports, latent profile analysis

## 1                    **Relationship between Coaching Climates and Student-Athletes'**

### 2                    **Symptoms of Burnout in School and Sports**

3    Recently, the dual career pathway, where elite sports and education are combined, has received  
4    increasing attention (EU Guidelines, 2012; Stambulova & Wylleman, in press). Previous research  
5    indicates that combining athletic and educational pursuits brings extra challenges to student-  
6    athletes due to time constraints and high expectations to succeed in both domains (e.g., Cosh &  
7    Tully, 2015; xxx, 2017; Sisjord & Sorensen, 2018; Stambulova, Engström, Franck, Linnér, &  
8    Lindahl, 2015). The desire for success in school as well as sports leaves less time for both physical  
9    and mental recovery and, consequently, may compromise student-athletes' well-being exposing  
10   them to burnout. One important factor that plays a role in student-athletes' well-being (or lack of  
11   it) during the dual-career pathway is coaching (Appleton & Duda, 2016; Cosh & Tully, 2015). For  
12   example, autonomy-supportive coaching (i.e., coaching that takes the athlete's perspective into  
13   account) has been found to be related to higher psychological well-being in sports, whereas  
14   controlling coaching (i.e., coaching that pressures athletes into matching their way of thinking and  
15   behaving with the coach's ideals) has been related to more negative outcomes (Balaguer et al.,  
16   2012; Isoard-Gauthier, Guillet-Descas, & Lemyre, 2012).

17                Thus far, research on the role of coaches has focused on the sports context and although  
18   there is some evidence that the demands and resources associated with the two domains of dual  
19   career, sports and school, may interact (Cosh & Tully, 2015; xxx, 2018a; Stuntz, 2016), little is  
20   known about the coaches' role in student-athletes' well-being in school. Since school-aged  
21   athletes spend a great deal of time interacting with their coaches, it is important to understand the  
22   role of coaches in student-athletes' well-being in both of the dual career contexts (i.e., in  
23   successful dual-career pathway; xxx, 2016). One indicator of lack of well-being among student-  
24   athletes is the presence of symptoms of burnout (González, García-Merita, Castillo, & Balaguer,

25 2016; xxx, 2018a). The aim of the present study was to investigate how different coaching  
26 climates relate to student-athletes' symptoms of burnout in sports and in school.

### 27 **Sport and School Burnout**

28 Burnout occurring in the sports context (i.e., athletic burnout; Raedeke, 1997) has been defined as  
29 a multidimensional construct consisting of three sub-dimensions: 1) exhaustion in sports, 2) sport  
30 devaluation or cynicism towards sports, and 3) feelings of inadequacy as an athlete (Raedeke,  
31 1997; Raedeke & Smith, 2001; xxx, 2017). Exhaustion in sports can be physical or emotional,  
32 stemming from, for example, intense training and competition; cynicism is related to a negative  
33 attitude toward training and competition; and feelings of inadequacy occur as a reduced sense of  
34 accomplishment and a lack of competence in one's sports performance (Eklund & Defreese, 2017;  
35 xxx, 2017).

36 According to the broadly known psychological stress and coping model of athlete  
37 burnout, that is, the cognitive affective model (Smith, 1986), sport burnout develops when the  
38 demands experienced by the athlete continuously exceed the available resources. At the beginning  
39 of the process, the athlete experiences situational demands, such as high expectations or an  
40 excessive training load, after which cognitive appraisal, where the situation is perceived as either  
41 challenging or threatening, takes place. This is followed by a matching physiological response  
42 (e.g., anxiety). If the stressful process continues, the athlete is likely to withdraw from sports. In  
43 previous research, sport burnout has not only been shown to be an indicator of athletes' ill-being  
44 but it has also been related to various negative outcomes, such as reduced performance, an  
45 increased level of injuries, decreased motivation, and eventually sport dropout (for a review, see  
46 Gustafsson, Defreese, & Madigan, 2017).

47 In the dual career context, athletes try to manage with the demands of two different life  
48 domains—sports and school/education—and, consequently, symptoms of burnout may take place  
49 not only in sports but also in school (xxx, 2017; see also, Cosh & Tully, 2015). School burnout has  
50 been defined with three dimensions similar to those conceptualized in sports context: 1)

51 exhaustion (i.e., tiredness or chronic fatigue) at school, 2) cynicism (i.e., distant attitude or lack of  
52 interest) toward school, and 3) feelings of inadequacy (i.e., lower level of perceived competence  
53 or lower achievement goals) as a student (Salmela-Aro, Kiuru, Leskinen, & Nurmi, 2009).  
54 Analogously with the Smith's (1986) cognitive affective model applied in the sports context, the  
55 psychological stress and coping model applied in the school context, that is, the demands-  
56 resources model (Salmela-Aro & Upadyaya, 2014; see also, Demerouti et al., 2001) suggests that  
57 school burnout develops as a consequence of school-related demands (e.g., overload of  
58 schoolwork) continuously exceeding the available resources (e.g., social support). According to  
59 the model, the first step in the development of school burnout is the energy-depleting process of  
60 gradually wearing out. This is followed by a motivational process, in which the absence of  
61 sufficient resources prevents effective coping with study demands, leading finally to  
62 disengagement and withdrawal. School burnout has been shown to have severe consequences for  
63 adolescents, for example, leading to depression (Salmela-Aro, Savolainen, & Holopainen, 2009)  
64 and dropout from school (Bask & Salmela-Aro, 2013).

65         The demands and resources framework may be particularly useful for examining burnout  
66 among student-athletes because striving for success on two domains instead of one may expose  
67 student-athletes to be under more demands than would be evident when striving for success only  
68 in one domain (i.e., only athletics or academics). Although the research on sport and school  
69 burnout has traditionally followed somewhat separate lines of research, recently there has been an  
70 increasing interest focusing on student-athletes' well-being not only within but also across the two  
71 contexts of dual career (Cosh & Tully, 2015; Stambulova & Wylleman, in press; Stuntz, 2016;  
72 xxx, 2016). Recent research on the topic has demonstrated that although sport and school burnout  
73 are somewhat related constructs (i.e., they correlate positively with each other), they nevertheless  
74 are empirically separate constructs demonstrating factorial validity (xxx, 2018b, 2019). The  
75 domain-specificity of the symptoms of burnout is well understandable from a theoretical point of

76 view as well since in sport burnout the source of stress is sports, and in school burnout, in turn,  
77 school. Nevertheless, some evidence exists that, over time, exhaustion experienced in school spills  
78 over to the sports context (xxx, 2018a), making the investigation of school burnout among  
79 student-athletes essential also from the perspective of sports context.

### 80 **Coaching Climate and Burnout**

81 Besides one's team members and family, coaches play an important role in athletes' lives and,  
82 therefore, can be important social supports in promoting athletes' well-being (Cosh & Tully,  
83 2015). However, if not supportive, coaching can also be a source of psychological ill-being.  
84 Particularly, coaching climate, that is, the psychosocial environment that the coach creates for the  
85 athletes (Appleton, Ntoumanis, Quested, Viladrich, & Duda, 2016) has been suggested to have  
86 important influences on athletes' psychological well-being (Cronin & Allen, 2015).

87         The Achievement Goal Theory (AGT) framework on coaching (Nicholls, 1989) divides  
88 the coach-created motivational environments into two different situation-focused climates: a task-  
89 involving climate and an ego-involving climate. A task-involving climate is characterized as a  
90 situation where athletes perceive that the coach values cooperative learning and effort, and that  
91 each athlete on the team has an important role (Newton, Duda, & Yin, 2000). In an ego-involving  
92 environment, in turn, athletes compare themselves to other athletes (e.g., to teammates), the coach  
93 tends to favor the better players, and competition is present within the team (Newton et al., 2000).  
94 In the previous literature, an ego-involving climate has been linked to higher sport burnout scores  
95 and a task-involving climate to lower sport burnout scores among student-athletes (Harris &  
96 Smith, 2009; Vitali et al., 2015).

97         Studies applying the Self Determination Theory (SDT) framework (Deci & Ryan, 2000)  
98 on coaching, in turn, suggest that coaching styles can be either autonomy-supportive, controlling,  
99 or characterized by elements of both (Isoard-Gauthier et al., 2012). In autonomy-supportive  
100 coaching, the coach considers athletes' preferences and listens to their feelings and thoughts



101 (Appleton et al., 2016). In contrast, a controlling-coaching style refers to an environment where  
102 the coach is perceived as coercive and authoritarian, and the coach does not consider athletes'  
103 opinions in terms of sports-related decision-making (Isoard-Gauthier et al., 2012). Following the  
104 SDT, the autonomy-supportive coaching style can be assumed to support athletes' basic  
105 psychological needs (i.e., need for autonomy, competence, and relatedness), whereas controlling  
106 coaching style can be seen to thwart these needs and, consequently, expose athletes to symptoms  
107 of burnout (Isoard-Gauthier et al., 2012; see also, González et al., 2016). In the study by Balaguer  
108 et al. (2012), autonomy-supportive coaching was related to lower burnout scores and controlling  
109 coaching, in turn, to increased burnout scores.

110         Recently, Duda (2013) encapsulated the major social environmental elements of both the  
111 AGT and the SDT and created a new multidimensional and hierarchical conceptualization of the  
112 coach-created motivational climate. According to Duda (2013), motivational climate can be more  
113 or less empowering and/or disempowering. An empowering motivational climate is marked by a  
114 task-involving, autonomy-supportive, and social supportive environment, whereas a  
115 disempowering climate is characterized by an ego-involving and more controlling environment  
116 (Appleton et al., 2016; Duda, 2013). The basic idea behind of Duda's (2013) conceptualization is  
117 that empowering climates will satisfy athletes' basic psychological needs for autonomy,  
118 competence, and relatedness and, because of this, promote not only athletes' context-specific but  
119 also their overall health (see also, Lentz, Kerins, & Smith, 2018). The relation between these  
120 coaching climates and athletes' well-being has thus far only been investigated in a few studies. In  
121 one of these studies, Appleton and Duda (2016) found the empowering coaching climate to be  
122 related to lower levels of sport burnout symptoms and the disempowering coaching climate to  
123 higher levels.

124         Overall, previous literature suggests that coaches play a role in athletes' psychological  
125 well-being and can contribute to athletes' symptoms of burnout (or lack of them) in sports context.

126 So far, studies relating to the effects of coaching on athletes' well-being (or ill-being) have  
127 nevertheless focused on athletes' well-being in sports context only, although there is some  
128 evidence that the demands and resources in the two domains of dual career (i.e., sports and school)  
129 may interact (Cosh & Tully, 2015; Stuntz, 2016; xxx, 2018a). For example, Stunzt (2016)  
130 demonstrated that coaches knowing and caring about aspects of athletes' lives beyond the sports  
131 context (i.e., cross-domain relationships; Stuntz, 2016, p. 17) was associated with greater  
132 perceived competence, enjoyment, and sport commitment among a sample of collegiate athletes.  
133 In the recent mixed-methods study by xxx (2018a), high school student-athletes who reported  
134 experiences of disempowering coaching also reported school-related stress (see also, Cosh &  
135 Tully, 2015), suggesting that coaches' roles may extend over from the sports context to school as  
136 well.

137         One theoretical model that can be used when aiming to understand the cross-domain  
138 relationship between sports and school contexts is the trans-contextual model of motivation  
139 (Hagger, Chatzisarantis, Culverhouse, & Biddle, 2003; Hagger & Chatzisarantis, 2012).  
140 According to this model, students' perceived autonomy support in one context may foster self-  
141 determined (i.e., autonomous) motivation not only in that particular context, but also in another  
142 related context (Hagger et al., 2003). More specifically, the model suggests that—as a results of the  
143 positive transfer-effect of the internal perceived locus of causality across contexts—motivation in a  
144 particular context is determined partly by motivation in related contexts (or global level  
145 motivation; Vallerand, 2007). Among student-athletes who have selected to integrate elite sports  
146 with education by studying in a sports high school, sports and education are closely related  
147 developmental contexts. Following this line of thought, perceived autonomy support from coaches  
148 (or teachers) can be assumed to foster student-athletes' autonomous motivation and related well-  
149 being in sports (or school), which then extends to another relevant context for student-athletes;

150 school (or sports). Nevertheless, the role of the coaching climate on school burnout has not been  
151 investigated before.

### 152 **The Aims of the Study**

153 The current study examined the associations of different coaching styles with student-athletes'  
154 burnout symptoms in the two domains of dual career, that is, sports and school. First, we  
155 examined whether the coaching climates, that is, empowering and disempowering climates,  
156 suggested by Duda's (2013) theory could be identified among the sample of Finnish high school  
157 student-athletes and how these are distributed throughout the data. In the present study, we applied  
158 a person-oriented approach on coaching climates. Since this approach focuses on individuals  
159 rather than the associations between variables at the population level (Bergman, Magnusson, & El-  
160 Khouri, 2003), it made it possible to consider unobserved heterogeneity that represents  
161 qualitatively different relationships between the assessed coaching variables. The major  
162 advantages of this person-oriented approach in comparison with the variable-oriented approach, is  
163 that it provides not only the option to identify different groups of individuals according to the  
164 pattern they show with respect to criteria variables, but also to examine the proportion of sample  
165 that show a particular pattern (Aunola et al., 2015). We hypothesized that we could identify two  
166 coaching climate groups: disempowering and empowering coaching climates (hypothesis 1; Duda,  
167 2013). A hypothesis concerning the proportion of sample showing a particular climate was not set  
168 due to lack of previous studies on the topic.

169         Second, because various previous studies have demonstrated differences in coaching  
170 climates depending on the type of sports (empowering climate being more typical among athletes  
171 in individual-sports than those in team-sports; Rhind, Jowett, & Yang, 2012) and athletes' gender  
172 (males reporting higher levels of disempowering climate and females higher levels of empowering  
173 climate; Smith, Cumming, & Smoll, 2008; see also, Vazou, Ntoumanis, & Duda, 2006), whether  
174 coaching climates would also differ in the present sample based on these variables was

175 investigated. We hypothesized that males would be over-represented in the disempowering group  
176 (hypothesis 2) and that females would be over-represented in the empowering group (hypothesis  
177 3; Smith et al., 2008). Furthermore, we hypothesized that individual-sports student-athletes would  
178 be over-represented in the empowering group (hypothesis 4; Rhind et al., 2012).

179 Finally, we examined the extent to which the perceived coach-created climate is related to  
180 athletes' symptoms of burnout (exhaustion, cynicism, and inadequacy) in sports and in school.  
181 Based on the previous studies within the AGT and SDT frameworks, we hypothesized that  
182 student-athletes in disempowering coaching climates would experience more symptoms of  
183 burnout in sports compared to student-athletes in empowering coaching climates (hypothesis 5;  
184 Balaguer et al., 2012; Harris & Smith, 2009; Vitali et al., 2015). We also expected that perceived  
185 coaching climate would be similarly related to symptoms of burnout in school (hypothesis 6; xxx,  
186 2018a).

## 187 **Method**

### 188 **Participants and Procedure**

189 This study is part of the Finnish Longitudinal Dual Career Study (xxx, 2016) in which adolescent  
190 athletes' dual-career development has been followed throughout high school. The procedure of the  
191 overall study was approved by the Ethical Committee of the relevant university in June 2015. The  
192 current study took place when the adolescents were ending their second year in high school. The  
193 sample consisted of 490 student-athletes (49% female, 51% male), born mostly in 1999, from  
194 seven different sports high schools in Finland. In Finland, talented youth athletes can apply to a  
195 sports upper secondary school ('urheilulukio' in Finnish) that structurally supports the  
196 construction of a dual career pathway by, for example, collaborating with athletic clubs and sports  
197 federations to hold morning practices for athletes, and giving some course credit for sports.

198 In the sample, 47.3% of the adolescents participated in individual and 52.4% in team  
199 sports. Almost half of the students (49.2%) reported that their goal is to become a professional

200 athlete, while 35.7% did not aim for a career as a professional athlete, and the rest did not answer  
201 the question. The reported grade point average of the student-athletes was, on average, 8.01 ( $SD =$   
202 0.922) on a scale of 4 to 10. A total of 76 participants were excluded from the final analysis due to  
203 missing information on the variables used in this study. The excluded participants were randomly  
204 distributed in terms of the background variables ( $\chi^2(14) = 7.207, p = .926$ ). Participants filled in  
205 surveys online via Mr Interview software during their school hours or in their free time.

## 206 **Measures**

207 **School burnout.** School burnout was measured via the School Burnout Inventory (SBI;  
208 Salmela-Aro et al., 2009). The SBI consists of ten items measuring three different dimensions of  
209 school burnout: 1) exhaustion at school (four items, e.g., “I brood over matters related to my  
210 school work a lot during my free time”), 2) cynicism towards school (three items, e.g., “I feel like  
211 I am losing interest in my school work”), and 3) feelings of inadequacy at school (three items, e.g.,  
212 “I often have feelings of inadequacy in my school work”). The items were each rated on five-point  
213 Likert-scale (1 means “strongly disagree,” and 5 means “strongly agree”). To create indices for the  
214 three subscales of school burnout, the mean of the standardized items was calculated separately for  
215 each subscale. The Cronbach’s  $\alpha$  reliabilities for the three subscales were .855, .854, and .803,  
216 respectively. For the overall school burnout scale, Cronbach’s  $\alpha$  reliability was .881.

217 **Sport burnout.** Sport burnout was measured with the Sport Burnout Inventory—Dual  
218 Career (SpBI-DC) form (xxx, 2017) developed on the basis of SBI. The SpBI-DC has been  
219 developed to have identical methods of measurement for burnout symptoms in the school and  
220 sports domains. Having identical, domain-matching items on school and sports domains allows for  
221 parallel investigation of sport and school burnout in a dual career context. The scale consisted of  
222 10 items measuring three dimensions of sport burnout: 1) exhaustion with one’s sports includes  
223 four items (e.g., “I feel overwhelmed by my sports”), 2) cynicism toward the meaning of one’s  
224 sports includes three items (e.g., “Sports don’t interest me anymore”), and 3) feelings of

225 inadequacy as an athlete includes three items (e.g., “I often have feelings that I’m not doing well  
226 in my sports”). The items were each rated on five-point Likert-scale (1 means “strongly disagree,”  
227 and 5 means “strongly agree”). To create indices for the three subscales of sport burnout, the mean  
228 of the standardized items was calculated separately for each subscale. The Cronbach’s  $\alpha$   
229 reliabilities for the three subscales were .752, .834, and .794, respectively. For the overall sport  
230 burnout scale, Cronbach’s  $\alpha$  reliability was .874. The scale has previously been shown to be a  
231 reliable and valid instrument for measuring sport burnout in a dual career context (xxx, 2017).

232         **Coaching climate.** The Empowering and Disempowering Motivational Climate  
233 Questionnaire (EDMCQ-C) was used to measure athletes’ experiences in regard to coaching  
234 climate (Appleton et al., 2016). The questionnaire consisted of 32 items that were rated on five-  
235 point Likert-scale ranging from 1 (strongly disagree) to 5 (strongly agree). The questionnaire  
236 consisted of five subscales measuring different aspects of coaching climates. Task-involving  
237 coaching consisted of nine items (e.g., “My coach encourages players to try new skills”),  
238 autonomy-supportive coaching consisted of five items (e.g., “My coach gives players choices and  
239 options”), socially supportive coaching consisted of three items (e.g., “My coach really  
240 appreciates players as people, not just as athletes”), ego-involving coaching of seven items (e.g.,  
241 “My coach substitutes players when they make a mistake”), and controlling coaching of eight  
242 items (e.g., “My coach pays less attention to players when they displease him/her”). To create  
243 indices for the five subscales measuring the coaching climates, the mean of the standardized items  
244 was calculated separately for each subscale. Cronbach’s  $\alpha$  reliabilities for the five subscales were  
245 .875, .784, .789, .855, and .732, respectively.

#### 246 **Analysis Strategy**

247 The analyses were carried out according to the following steps. First, Latent Profile Analyses  
248 (LPA) was conducted to identify different coaching climates using task-involving, ego-involving,  
249 autonomy-supportive, socially supportive, and controlling coaching as criteria variables. The



274 The first research question asked what kind of coaching climates can be identified among the  
275 sample and how these climates are distributed throughout the data. The model fit indices and class  
276 sizes of two- to six-class solutions of LPA are shown in Table 2. The log L, AIC, BIC and aBIC  
277 values decreased when the number of classes increased (see Table 2) suggesting that even more  
278 than six classes could be found. Similarly, the BLRT suggested that even more than six profiles  
279 could be identified. However, according to the VLMR and the LMR results, the four-class  
280 solution was better than the three-class solution and increasing the number of classes did not  
281 improve the fit of the model. Due to the entropy value being higher in the four-class solution than  
282 in the five or six-class solutions as well, this solution was selected for further analysis.

283         Based on the VLMR and LMR, also the two-class solution could have been considered  
284 suitable. According to these two tests, the two-class solution was better than the one-class solution  
285 but the three-class solution was only statistically marginally ( $p < .10$ ) superior compared to the  
286 two-class solution. However, previous simulation studies (Nylund, Asparouhov, & Muthén, 2007;  
287 Tolvanen, 2007) suggest that when the different fit indices end up to support different number of  
288 latent profiles, BIC-value from information criteria values and BLRT from statistical tests are the  
289 most reliable indices compared to other indices. It is not unusual, however, that these indices  
290 continue to decrease when increasing number of profiles. In that case, reduction in the change of  
291 information criteria values (rather than values themselves) can be used to decide the optimal  
292 number of latent profiles (Wang, Morin, Ryan, & Liu, 2016). In the present study, the reductions  
293 in the AIC, BIC, and aBIC values were relatively high when comparing two-class solution to  
294 three-class solution, or three-class-solution to four-class solution. However, from the four-class  
295 solution forward, the reduction in the values was notably smaller indicating that the improvement  
296 of the fit was decreasing. Inspection of these decreases in information criteria values provided,  
297 thus, further support for the selected four-class solution.



298 The groups' means (*M*) and standard deviations (*SD*) for the coaching climate variables  
299 and the result of the analysis of variance (ANOVA) comparing the found four groups according to  
300 the criteria variables are presented in Table 3. The coaching climate profiles of the found groups  
301 are shown in Figure 1. The first group consisted of participants whose coaches used less ego-  
302 involving and controlling coaching but more autonomy-supportive, socially supportive, and task-  
303 involving coaching compared to the other three groups, thus we labeled it as the empowering  
304 coaching climate (see Table 3). This climate was typical for a total of 24% of student-athletes. The  
305 second and the largest group (typical for a total of 42% of student-athletes) was characterized by  
306 average levels of all coaching variables, thus indicating average levels of both empowering and  
307 disempowering features of coaching. Consequently, this group was labeled as the *intermediate*  
308 coaching climate. The third group, consisting of 27% of student-athletes, labeled as the  
309 *disempowering* coaching climate, consisted of participants experiencing significantly less  
310 autonomy-supportive, socially supportive, and task-involving coaching and significantly more  
311 ego-involving and controlling coaching compared to the previous two groups. The final, and the  
312 smallest group with 7% of the participants, was labeled as the *extremely disempowering* coaching  
313 climate, consisted of participants who experienced lower levels of socially supportive, task-  
314 involving, and autonomy-supportive coaching compared to the other three groups. Student-  
315 athletes in this group also reported higher levels of ego-involving and controlling coaching than  
316 those in the empowering and intermediate groups.

### 317 **Gender and Type of Sport Differences in the Perceived Coaching Climates**

318 The second aim was to examine whether there are differences between gender or type of sport in  
319 the perceived coaching climate groups. A chi-squared analysis showed a statistically significant  
320 association between group membership and gender ( $\chi^2(3, N = 411) = 7.78, p = .05$ ): females were  
321 over-represented among those who reported an empowering climate (29% of females being in this  
322 group; adj.res = 2.0,  $p < .05$ ) and under-represented among those reporting disempowering climate

323 (22% of females being in this group; adj.res = -2.1,  $p < .05$ ), whereas males were under-  
324 represented among empowering group (20% of males being in this group; adj.res = -2.0,  $p < .05$ )  
325 and over-represented among disempowering group (32% of males being in this group; ad.res =  
326 2.1,  $p < .05$ ). The association between group membership and type of sport was only marginally  
327 significant ( $\chi^2(3, N = 413) = 7.43, p = .06$ ): team-sports athletes were over-represented among  
328 disempowering group (32% of team sports athletes being in this group; adj.res = 2.6,  $p < .05$ ),  
329 whereas individual-sports athletes were under-represented among this group (20% of individual  
330 sports athletes being in this group; adj.res = -2.6,  $p < .05$ ).

### 331 **Coaching Climate and Burnout in Sports**

332 The third aim was to find out the extent to which the experienced coaching climate is related to  
333 athletes' burnout (exhaustion, cynicism, and inadequacy) in sports. The results of MANOVA  
334 showed that the interaction effects of Gender  $\times$  Coaching climate ( $F(9, 963) = 1.037, p = .408$ )  
335 and that of Type of sport  $\times$  Coaching climate ( $F(9, 963) = 0.478, p = .890$ ) were not statistically  
336 significant, suggesting that gender and type of sport did not moderate the association of coaching  
337 climate with sport burnout. The main effect of coaching climate, in turn, was statistically  
338 significant (Wilks'  $\lambda = 0.860, F(9, 963) = 6.823, p < .001, \eta_p^2 = .047$ ). The test of between-  
339 subjects effects revealed that there were significant differences between the coaching climate  
340 groups in all three sport burnout subscales ( $p < .001$ ). The z-scores and standard deviations for the  
341 burnout subscales in coaching climate groups are presented in Table 4. The results of pairwise  
342 comparisons (see Table 4) revealed that athletes in the empowering group had significantly lower  
343 levels of exhaustion, feelings of inadequacy, and cynicism compared to athletes in the  
344 disempowering and extremely disempowering group, as well as a lower level of exhaustion than  
345 athletes in the intermediate group. Athletes in the intermediate group reported a lower level of  
346 exhaustion and feelings of inadequacy than athletes in the two disempowering groups and a lower  
347 level of cynicism than those in the extremely disempowering group. Athletes in the

348 disempowering and extremely disempowering groups did not differ from each other in terms of  
349 sport burnout symptoms.

### 350 **Coaching Climate and Burnout in School**

351 Next, a similar MANOVA was conducted to find out the extent to which the experienced coaching  
352 climate was related to athletes' burnout in school. The results showed, first, that the interaction  
353 effects of Gender  $\times$  Coaching climate ( $F(9, 949) = 0.820, p = .598$ ) and Type of sport  $\times$  Coaching  
354 climate ( $F(9, 949) = 1.146, p = .327$ ) were not statistically significant. The main effect of  
355 coaching climate, however, was statistically significant (Wilk's  $\lambda = 0.923, F(9, 949) = 3.508, p <$   
356  $.001, \eta_p^2 = .026$ ). The test of between-subjects effects revealed that there were significant  
357 differences between the clusters in all three school burnout subscales ( $p < .001$  for exhaustion and  
358 inadequacy and  $p < .05$  for cynicism). The z-scores and standard deviations for the school burnout  
359 subscales in coaching climate groups are presented in Table 4. The results of pairwise  
360 comparisons (see Table 4) revealed that athletes in the empowering group reported experiencing  
361 feelings of inadequacy in academics less than athletes in the other three groups. Moreover, they  
362 reported less exhaustion at school than those in the disempowering and extremely disempowering  
363 groups and less cynicism towards school work than those in the disempowering group. Athletes in  
364 the intermediate, disempowering and extremely disempowering groups did not differ from each  
365 other in terms of school burnout symptoms.

### 366 **Discussion**

367 The first aim of this study was to examine how Duda's (2013) motivational climate theory fit to  
368 the data of Finnish high school student-athletes. The results of the present study revealed that 34%  
369 of the student-athletes reported either a disempowering (27%) or an extremely disempowering  
370 (7%) coaching climate, whereas the empowering coaching climate was typical for 24% of the  
371 student-athletes. Overall, these three climates were in accordance with our first hypothesis and  
372 with Duda's (2013) theory (i.e., they were clearly either disempowering or empowering). Due to

373 the fact that none of the previous studies have tested Duda's (2013) theory using a person-oriented  
374 approach, the findings of the present study provide important support for the theory by showing  
375 that empowering and disempowering coaching climates can be identified not only theoretically but  
376 also empirically based on student-athletes' perceptions of coaching climates.

377         However, one unexpected type of climate was also found, namely the intermediate  
378 climate (reported by 42% of student-athletes), in which the student-athletes scored between the  
379 empowering and disempowering coaching climates in all the coaching climate subscales. This  
380 result suggests that the coaching climate is not necessarily either disempowering or empowering  
381 but can also be something between these two (see also, Smith et al., 2016). It is noteworthy that  
382 the intermediate group comprised the largest group in our study. One possible explanation for this  
383 result is that coaches use both empowering and disempowering behaviors when interacting with  
384 athletes (e.g., Smith et al., 2016; Smith, Quested, Appleton, & Duda, 2017). This shifting between  
385 empowering and disempowering coaching might stem, for example, from daily variations (Aunola  
386 et al., 2015) in the coaches' own stress levels or ill-being. Another possibility is that coaches  
387 behave differently in different situations, for example, in training and competition environments  
388 (e.g., Smith et al., 2017), and, due to this, athletes are not able to rate their coaches to be either  
389 disempowering or empowering. To understand why those in the intermediate group experience  
390 their coaching climates the way they do, further studies applying qualitative methods might be  
391 effective in developing an answer.

392         The second aim of this study was to examine the distribution of the coaching climates  
393 with respect to gender and type of sport. The results concerning the role of gender were in line  
394 with our hypothesis two and three, as well as with previous findings (Smith et al., 2008; Vazou et  
395 al., 2006), as males were over-represented in the disempowering coaching climate group and  
396 females, in turn, in the empowering coaching climate group. This result may indicate that females'  
397 coaches use more autonomy-supportive, socially supportive, and task-involving coaching than

398 those of males, which would be in line with the theorization that social agents, including coaches,  
399 emphasize differential elements of the achievement context to males and females (White & Duda,  
400 1994). Alternatively, it is also possible that the result is due to the differences between females and  
401 males in motivational patterns and, thus, their way of perceiving the motivational climate created  
402 by coaches and related cues (White & Duda, 1994). As coaches educate themselves more, they are  
403 possibly becoming more aware of gender differences in motivation and modify their behavior to fit  
404 the athletes' needs.

405         In the present study, the type of sport was found to be only marginally related to coaching  
406 climate: student-athletes in team sports were over-represented among the disempowering group,  
407 whereas student-athletes in individual sports were under-represented among this group (hypothesis  
408 4). The result suggests that team sports' coaches may use more controlling and ego-involving, and  
409 less autonomy-supportive, socially supportive, and task-involving coaching compared to coaches  
410 of student-athletes in individual sports. One explanation is that in individual sports, athletes  
411 develop closer interpersonal relationships with their coaches than in team sports (Rhind et al.,  
412 2012) and, therefore, may experience the coaching climate as less disempowering. Although the  
413 results concerning type of sport were only marginally significant in the present study, they are in  
414 line with the previous findings reported by Rhind and colleagues (2012), suggesting that the  
415 disempowering climate, the climate that is related to burnout, may be more typical among athletes  
416 involved in team-sports than in individual-sports.

417         The third aim of the present study was to find the extent to which the experienced  
418 coaching climates are related to the student-athletes' symptoms of burnout in sports and school.  
419 The results concerning sport burnout supported hypothesis 5 as the student-athletes in the  
420 disempowering groups (i.e., disempowering and extremely disempowering groups) experienced  
421 higher sport burnout scores compared to the student-athletes in the empowering and intermediate  
422 groups. Our results are consistent with the previous research using Duda's (2013) theory of

423 empowering and disempowering coaching climates as the findings of Appleton and Duda (2016)  
424 revealed that an empowering coaching climate was negatively related, and a disempowering  
425 coaching was positively related to sport burnout (see also, Quested et al., 2013). The results of the  
426 present study are also in agreement with the previous studies that have approached coaching  
427 climates from the SDT or AGT perspectives (e.g., Balaguer et al., 2012; Vitali et al., 2015).  
428 Overall, the results indicate that athletes whose coaches emphasize that everyone has an important  
429 role on the team, value each athlete as a person and listen to athletes' thoughts and feelings,  
430 experience lower symptoms of burnout. On the contrary, more controlling coaching, intra-team  
431 competition, and punishing athletes for making mistakes is associated with higher levels of  
432 burnout. The results of the present study add to the previous literature by demonstrating with a  
433 person-oriented approach that although student-athletes in different subgroups perceived their  
434 coaching climates differently, not all subgroups differed from each other regarding sport burnout.  
435 Particularly, the fact that subgroups of student-athletes reporting intermediate and empowering  
436 coaching climates did not differ from each other in terms of sport burnout suggests that also  
437 coaching environments that are not clearly either disempowering or empowering can be 'good  
438 enough' environments what it comes to the prevention of sport burnout.

439         To the best of our knowledge, this study is the first to investigate the relationship between  
440 coaching climates and burnout in school. The results supported hypothesis 6 by revealing that the  
441 student-athletes in the two disempowering coaching climate groups experienced higher levels of  
442 school burnout than the student-athletes in the empowering coaching climate group. Interestingly  
443 and contrary to the results regarding sport burnout, the two disempowering groups and  
444 intermediate group did not differ from each other in regard to school burnout. Thus, these results  
445 suggest that the coaching climate must be empowering rather than intermediate or disempowering  
446 to protect student-athletes from burning out in school. One possible explanation for the result is  
447 that coaches creating empowering climates are concerned more of their athletes' holistic well-

448 being and development (e.g. are caring about aspects of athletes' lives beyond the sports context;  
449 Stunzt, 2016) than those with less empowering coaching style. Following the reasoning of trans-  
450 contextual model of motivation (Hagger et al., 2003) and cross-domain (Stunzt, 2016) models, it is  
451 also possible that the empowering climate created by coaches fosters student-athletes' autonomous  
452 motivation and related psychological well-being first in the sports context, which then is extended  
453 to school. According to the SDT (Deci & Ryan, 2000), people have innate needs for feelings of  
454 competence, relatedness, and autonomy. It is possible that the intermediate coaching climate does  
455 not fulfil these three needs well enough to protect the student-athletes from burning out in school  
456 (see also, Lentz et al., 2018).

457         This study had some limitations that should be considered before generalizing the results.  
458 First, the study was cross-sectional, and therefore we cannot assume causality between the  
459 variables: it is possible that the symptoms of burnout are reflected on how participants perceive  
460 the coaching climate or that there is a reciprocal relationship between these variables. The found  
461 relationship can also be explained by a third variable or, for example, time of year. It is possible,  
462 for example, that for some of the participants the symptoms of burnout were maximized at the end  
463 of the school year and, due to this, influenced the manner in which they perceived the coaching  
464 climate. Due to the cross-sectional data, it was not possible to examine the stability and changes in  
465 coaching climates either. In future studies, longitudinal research about student-athletes' possible  
466 shifting between different coaching climates and changes in burnout levels in school and sports  
467 would be important to obtain more information about the connection between coaching climates  
468 and burnout. Also, the possible consequences for this connection, such as dropout or performance  
469 outcomes, would be important to study to identify the different risk and resilience factors leading  
470 to (dis)continuity of the dual-career pathway.

471         Second, coaching climates were measured only from student-athletes' points of view. In  
472 future research, coaches' perceptions should also be considered. In addition, comparisons between

473 coaches' and student-athletes' perceptions on coaching climates would provide a bigger picture of  
474 the phenomenon, especially if coaches' and athletes' views differ from each other (see Smith et  
475 al., 2016). Furthermore, research into the ways different athletes rate the same coach would  
476 provide information on whether it is the individual's experience or the more general coaching  
477 style that plays a role in burnout

478 Third, in the present study, a relatively novel measure was used to assess sport burnout,  
479 that is, the SpBI-DC (xxx, 2017). Because the majority of the previous studies have used the  
480 Athlete Burnout Questionnaire (ABQ; Raedeke & Smith, 2001) to measure athletic burnout,  
481 whereas the present study does not, caution is advised when comparing the results of the present  
482 study to the previous research. In the present study, the focus was not only on sport burnout, but  
483 also on school burnout and, therefore, a comparable measure for these two different life domains  
484 was needed. Since the SpBI-DC is a relatively short measure with comparable items to the School  
485 Burnout Inventory (SBI; Salmela-Aro et al., 2009), and it was found to show good reliability, it  
486 can be considered to be a good candidate to measure sport burnout also in further studies,  
487 particularly in those focusing on student-athletes and their dual career development.

488 Fourth, the role of teaching environments was not investigated. Similarly as sports coaches  
489 were found to play a role in school burnout, teacher-created school environments may play a role  
490 in student-athletes' sport burnout. Future research on possible trans-contextual effects from school  
491 environment to sport context is therefore needed to get a bigger picture of the phenomenon.  
492 Finally, this study consisted of Finnish sports high school student-athletes. Seeing as the pattern of  
493 results may vary in different cultural and educational settings, future cross-cultural studies are  
494 needed to discover the similarities and differences in the reported findings between countries.  
495 Furthermore, it is possible that the experiences of students in sports schools are different from the  
496 experiences of those who are not in a sports school. Thus, before generalizing the results, future



497 studies in other kinds of dual-career environments and types of schools (e.g., vocational track) are  
498 needed.

### 499 **Conclusion**

500 The findings of the present study provide important support for Duda's (2013) theory by showing  
501 that both empowering and disempowering coaching climates can be identified based on student-  
502 athletes' perceptions of coaching climates. In addition to the empowering and disempowering  
503 coaching climates (Duda, 2013), however, the present study identified a climate that was between  
504 these two; the intermediate climate. This turned out to be the largest coaching climate group,  
505 which indicates that most of the coaches are rated as having a coaching style somewhere between  
506 disempowering and empowering. In terms of sport burnout, student-athletes belonging to the  
507 intermediate climate demonstrated levels of burnout as low as those belonging to the empowering  
508 climate. However, in terms of school burnout, those belonging to the intermediate climate showed  
509 equal levels of burnout symptoms as those belonging to the disempowering climates, suggesting  
510 that in order to prevent school burnout, instructions to avoid disempowering coaching climate may  
511 not be an optimal solution; rather, efforts to encourage an empowering climate might be needed.

512 The results suggest that in the dual-career pathway, coaches may have an important role  
513 not only in regard to student-athletes' psychological well-being in sports but also in school. As the  
514 empowering coaching climate was found to be the most favorable coaching climate to protect  
515 athletes from burnout both in sports and in school, this finding should be considered in the future  
516 education of coaches in order to inform and instruct them on how they can create an empowering  
517 coaching climate for their athletes. From a theoretical point of view, the findings of the present  
518 study add to the previous literature by demonstrating cross-contextual influence (Hagger et al.,  
519 2003; Stuntz, 2016) from sports context to school (see also, Cosh & Tully, 2015; xxx, 2018a):  
520 coaching climate is associated not only with student-athletes' symptoms of burnout in sports but  
521 also with their symptoms in school. Increasing the knowledge of these kinds of cross-contextual

522 influences may provide important insights into the role of coaches in student-athletes'  
523 development during adolescence for both the coaches and the athletes. When training coaches, it  
524 would be important to instruct them to support student-athletes' holistic development (Cosh &  
525 Tully, 2015; Stambulova & Wylleman, in press; Stuntz, 2016) by generating empowering  
526 coaching climates. Enhancing coaches' concern for athletes' holistic development and well-being  
527 could also facilitate youth athletes' efforts to successfully combine sports and education. Overall,  
528 this paper adds to the knowledge on how the created coaching climate can be related on athletes'  
529 well-being not only within but also across the domains of sports and school.

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**Table 1***Means (M), Standard Deviations (SD), and Inter-Correlations between Study Variables*

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	<i>M</i>	<i>SD</i>
<i>Symptoms of Burnout</i>													
1. Exhaustion <sup>1</sup>	1.00											2.75	0.95
2. Inadequacy <sup>1</sup>	.62 <sup>a</sup>	1.00										2.83	0.97
3. Cynicism <sup>1</sup>	.30 <sup>a</sup>	.61 <sup>a</sup>	1.00									2.45	0.95
4. Exhaustion <sup>2</sup>	.54 <sup>a</sup>	.47 <sup>a</sup>	.27 <sup>a</sup>	1.00								2.24	0.82
5. Inadequacy <sup>2</sup>	.43 <sup>a</sup>	.41 <sup>a</sup>	.19 <sup>a</sup>	.62 <sup>a</sup>	1.00							2.27	0.96
6. Cynicism <sup>2</sup>	.29 <sup>a</sup>	.28 <sup>a</sup>	.21 <sup>a</sup>	.49 <sup>a</sup>	.63 <sup>a</sup>	1.00						1.55	0.71
<i>Coaching</i>													
7. Controlling	.09	.18 <sup>a</sup>	.17 <sup>a</sup>	.25 <sup>a</sup>	.13 <sup>b</sup>	.22 <sup>a</sup>	1.00					2.50	0.65
8. Ego-involving	.13 <sup>b</sup>	.21 <sup>a</sup>	.13 <sup>b</sup>	.27 <sup>a</sup>	.21 <sup>a</sup>	.22 <sup>a</sup>	.76 <sup>a</sup>	1.00				2.63	0.85
9. Socially-supportive	-.19 <sup>b</sup>	-.23 <sup>a</sup>	-.15 <sup>b</sup>	-.28 <sup>a</sup>	-.25 <sup>a</sup>	-.22 <sup>a</sup>	-.49 <sup>a</sup>	-.55 <sup>a</sup>	1.00			3.77	0.82
10. Autonomy-supportive	-.17 <sup>a</sup>	-.17 <sup>b</sup>	-.14 <sup>b</sup>	-.27 <sup>a</sup>	-.22 <sup>a</sup>	-.26 <sup>a</sup>	-.41 <sup>a</sup>	-.49 <sup>a</sup>	.72 <sup>a</sup>	1.00		3.93	0.65
11. Task-involving	-.26 <sup>a</sup>	-.27 <sup>a</sup>	-.11 <sup>c</sup>	-.30 <sup>a</sup>	-.30 <sup>a</sup>	-.28 <sup>a</sup>	-.35 <sup>a</sup>	-.47 <sup>a</sup>	.75 <sup>a</sup>	.76 <sup>a</sup>	1.00	3.76	0.65

Note. <sup>c</sup>  $p < .05$ , <sup>b</sup>  $p < .01$ , <sup>a</sup>  $p < .001$ ; <sup>1</sup>school, <sup>2</sup>sports.



**Table 2***Model Fit Indices for Solutions with Different Number of Latent Classes (N = 414)*

	Log L (df)	AIC	BIC	ABIC	Entropy	VLMR*	LMR*	BLRT*	AvePP	class size (n)
2-classes	-1870.993 (16)	3773.986	3838.400	3787.629	0.841	< .001	< .001	< .001	.95 – .96	243, 171
3-classes	-1769.430 (22)	3582.859	3671.428	3601.617	0.805	0.073	0.077	< .001	.90 – .93	129, 189, 96
<b>4-classes</b>	<b>-1706.771 (28)</b>	<b>3469.541</b>	<b>3582.265</b>	<b>3493.415</b>	<b>0.840</b>	<b>0.016</b>	<b>0.017</b>	<b>&lt; .001</b>	<b>.90 – .93</b>	<b>101, 174, 109, 30</b>
5-classes	-1672.551 (34)	3413.101	3549.980	3442.090	0.814	0.371	0.381	< .001	.78 – .93	104, 142, 99, 41, 28
6-classes	-1651.859 (40)	3383.718	3544.752	3417.823	0.805	0.308	0.315	< .001	.77 – .91	76, 142, 89, 44, 35, 28

*Note.* Log L = Log-likelihood value; AIC = Akaike's information criterion; BIC = Bayesian information criterion; ABIC = Sample size adjusted Bayesian information criterion; LMR\* = Lo-Mendell-Rubin adjusted likelihood test, *p*-value; VLMR\* = Vuong-Lo-Mendell-Rubin likelihood ratio test, *p*-value; BLRT\* = Bootstrapped Likelihood Ratio Test, *p*-value. AvePP = Average Latent Class Posterior Probabilities.

**Table 3**

*Standardized Scores of Coaching Variables (Standard Deviations in Parentheses) for the Four Coaching Climate Groups*

	Coaching climate				<i>F</i> (3, 410)
	Extremely Disempowering ( <i>n</i> = 30)	Disempowering ( <i>n</i> = 109)	Intermediate ( <i>n</i> = 174)	Empowering ( <i>n</i> = 101)	
Controlling coaching <sup>b</sup>	0.594 (0.648)	0.365 (0.464)	-0.082 (0.503)	-0.423 (0.445)	61.846***
Ego-involving <sup>a</sup>	0.781 (0.663)	0.507 (0.528)	-0.090 (0.560)	-0.624 (0.537)	88.804***
Socially supportive <sup>b</sup>	-1.700 (0.521)	-0.692 (0.392)	0.206 (0.364)	0.898 (0.392)	496.159***
Autonomy-supportive <sup>b</sup>	-1.468 (0.735)	-0.466 (0.437)	0.085 (0.364)	0.792 (0.306)	304.887***
Task-involving <sup>b</sup>	-1.203 (0.672)	-0.551 (0.376)	0.087 (0.345)	0.801 (0.382)	306.968***

*Note 1.* \*\*\*  $p < .001$ .

*Note 2.* <sup>a</sup>Pairwise comparisons calculated using Bonferroni because the assumption of equal variances between the groups was confirmed; <sup>b</sup>pairwise comparisons calculated using Dunnett's T3 because the assumption of equal variances between the groups was not confirmed.

*Note 3.* All groups showed statistically significant difference ( $p < .01$ ) in all criteria variables with two exceptions: There was no difference in controlling coaching and ego-involving coaching between extremely disempowering and disempowering coaching climates.

**Table 4**

*Group Means (M) and Standard Deviations (SD) of Sports and School Burnout Subscales (Standardized Variables) in Different Coaching Climate Groups and Pairwise Comparisons between the Groups*

		Coaching climate	M (SD)	Pairwise comparisons, p-values		
				Empowering	Intermediate	Disempowering
<i>Sports</i>						
Exhaustion	Empowering		-.269 (0.638)	-		
	Intermediate		-.084 (0.717)	.227		
	Disempowering		.245 (0.772)	< .001	.001	-
	Extremely disempowering		.493 (0.845)	< .001	< .001	.596
Feelings of inadequacy	Empowering		-.262 (0.814)	-		
	Intermediate		-.104 (0.763)	.690	-	
	Disempowering		.237 (0.831)	< .001	<.001	-
	Extremely disempowering		.516 (0.922)	< .001	.001	.560
Cynical attitude toward	Empowering		-.278 (0.692)	-		
	Intermediate		-.042 (0.785)	.155	-	
	Disempowering		.173 (0.899)	.001	.223	-
	Extremely disempowering		.556 (1.277)	< .001	.003	.177
<i>School</i>						
Exhaustion	Empowering		-.204 (0.888)	-		
	Intermediate		-.019 (0.824)	.382	-	
	Disempowering		.190 (0.771)	.002	.201	-
	Extremely disempowering		.229 (0.813)	.059	.726	1.00
Feelings of inadequacy	Empowering		-.287 (0.867)	-		
	Intermediate		.015 (0.861)	.023	-	
	Disempowering		.191 (0.748)	< .001	.504	-
	Extremely disempowering		.320 (0.790)	.003	.397	1.00
Cynical attitude	Empowering		-.216 (0.871)	-		
	Intermediate		.005 (0.906)	.260	-	

Disempowering	.149 (0.794)	.015	1.00	-
Extremely disempowering	.213 (0.820)	.114	1.00	1.00

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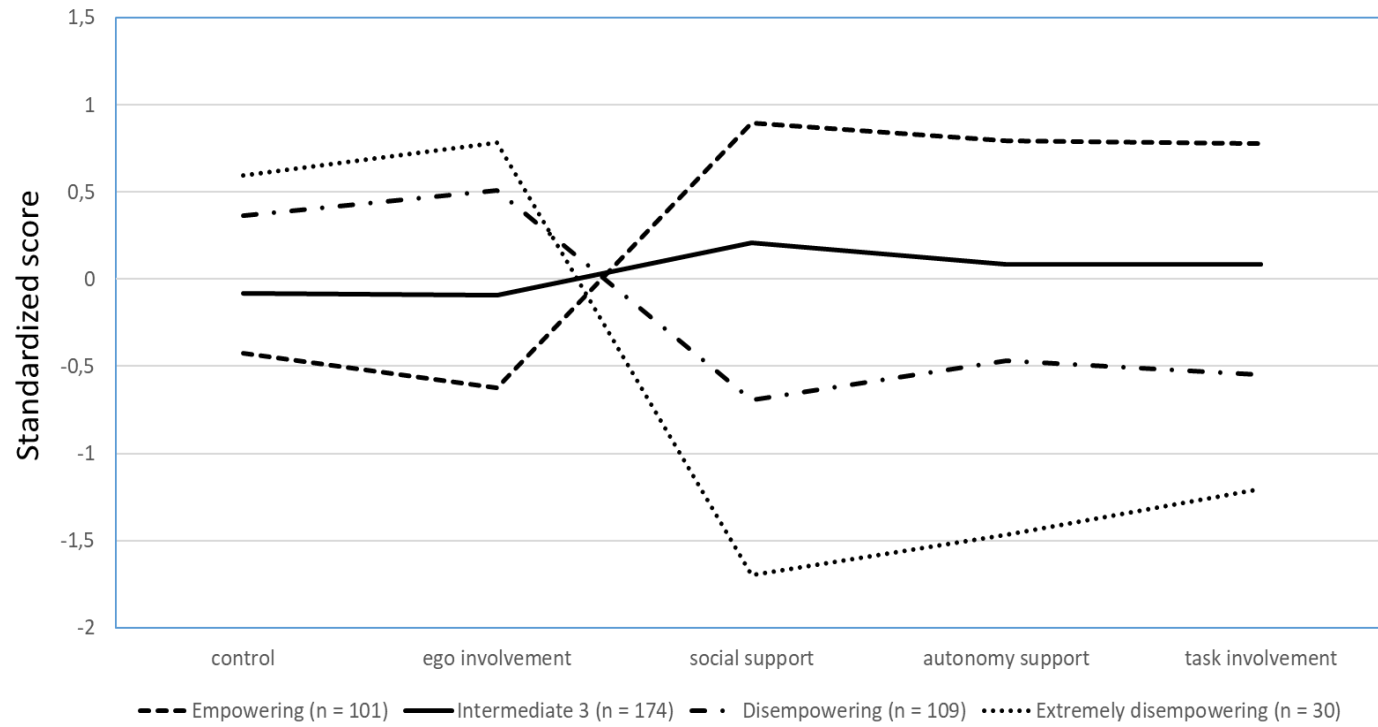


Figure 1. Coaching climate profiles.