

Running head: controlling coaching and mental toughness

**Controlling Coaching and Athlete Thriving in Elite Adolescent Netballers: The  
Buffering Effect of Athletes' Mental Toughness**

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## Abstract

2   **Objectives:** The purposes of this study were to examine the association between controlling  
3   coach behaviours and athlete experiences of thriving, and test the buffering effect of mental  
4   toughness on this relation.

5   **Design:** A cross-sectional survey.

6   **Methods:** In total, 232 female netballers aged 11 to 17 years ( $14.97 \pm 1.52$ ) with between 1  
7   and 15 years of experience in their sport ( $7.50 \pm 2.28$ ) completed measures of controlling  
8   coach interpersonal style, mental toughness and thriving.

9   **Results:** Latent moderated structural models indicated that (i) controlling coach behaviours  
10   were inversely related with experiences of vitality and learning; (ii) mental toughness was  
11   positively associated with psychological experiences of both dimensions of thriving; and (iii)  
12   mental toughness moderated the effect of coach's controlling interpersonal style on learning  
13   but not vitality experiences, such that the effect was weaker for individuals who report higher  
14   levels of mental toughness.

15   **Conclusions:** This study extends past work and theory to show that mental toughness may  
16   enable athletes to counteract the potentially deleterious effect of controlling coach  
17   interpersonal styles.

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20   **Keywords:** interpersonal style of communication; latent interactions; mentally tough;  
21   motivational climate; positive functioning; vitality; self-determination theory

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## Introduction

23        In April 2013, the college sports world was shocked, confused and concerned by  
 24    videos that aired on ESPN's "Outside the Lines". Mike Rice, Rutger's head coach of the  
 25   men's basketball team, appeared to be adopting excessive personal control, repeated  
 26   intimidation and abuse towards players (verbally and physically) during practice. Rutgers  
 27   took corrective action against this extreme case of controlling coaching behaviour and fired  
 28   Rice as head coach. The attention subsequently turned to the victims, the players. However,  
 29   some student-athletes reported to have been less affected negatively by Rice's controlling  
 30   behaviour. In competitive and stressful sporting environments (e.g., college, professional,  
 31   Olympic), are there individual resources that play an important role in buffering the negative  
 32   effects of contextual stressors, such as controlling coaching interpersonal styles? In this  
 33   study, we examine the role of mental toughness as one such potential buffer.

34        Despite the proliferation of definitions and conceptualisations over the past decade, a  
 35   common theme amongst what seems like a fragmented and noncumulative literature is the  
 36   centrality of mental toughness for reducing the potentially deleterious effects of contextual  
 37   stressors for the enactment and maintenance of goal-directed pursuits[1]. This core theoretical  
 38   tenet is captured in recent definitions in which mental toughness is conceptualised as "a  
 39   personal capacity to produce consistently high levels of subjective (e.g., goal progress) or  
 40   objective performance (e.g., sales, race time, GPA), despite everyday challenges and stressors  
 41   as well as significant adversities" (p.28)[2]. As such, mental toughness is considered pertinent  
 42   for major assaults (e.g., ACL injury) as well as acute (e.g., equipment malfunction) or chronic  
 43   (e.g., controlling coach) stressors that can impede human functioning<sup>1</sup>. Consistent with

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<sup>1</sup> Resilience is often used interchangeably with mental toughness despite their conceptual differences, yet there are two key differences between these concepts<sup>2</sup>. First, resilience can apply to a broad array of systems (e.g., individuals, communities, economies), whereas mental toughness is confined to individuals. Second, resilience encompasses a range of protective factors including individual, social, and community resources. Mental toughness can be considered a resilience (personal) resource but does not capture the breadth and depth of protective factors of resilience.

44 theoretical perspectives of stress[3], research has shown that mental toughness is positively  
45 associated with important indicators of human functioning (e.g., performance) because  
46 individuals high in mental toughness are less distressed and better able to cope with  
47 contextual demands[2]. An alternative yet largely untested perspective is that when  
48 individuals perceive a situation as stressful, the deleterious effects of stress may be less for  
49 individuals with high levels of mental toughness (i.e., buffering hypothesis). Researchers  
50 have examined the salience of mental toughness for functioning within a specific context  
51 (e.g., sport, workplace) solely in relation to life stress[4]. As such, there is a need for research  
52 that tests the buffering effects of mental toughness when the stressor and indicator of  
53 functioning are captured within the same context, sport, in the case of this paper.

54 In testing the buffering effect of mental toughness, we draw from recent work[5,6]  
55 where self-determination theory (SDT)[7] was employed as a guiding theoretical framework.  
56 Within the context of SDT, optimal human functioning can be fostered through the  
57 satisfaction of the psychological needs of autonomy (i.e., feelings of volition and self-  
58 endorsement), competence (i.e., feeling skilled and capable), and relatedness (i.e., feeling  
59 social valued and connected with others)[8]. Of central importance are social environments in  
60 which key agents in positions of authority (e.g., coaches) support or undermine these  
61 psychological needs through their interactions with others. Much work has focused on coach  
62 behaviours and interpersonal styles that satisfy these three needs (e.g., choice within  
63 boundaries, encouraging athlete input, provision of guidance and constructive feedback)  
64 because they predict a range of indices related to optimal functioning[9]. In recent years,  
65 however, researchers have devoted greater attention to understanding the motivational  
66 strategies and behaviours of social agents that may lead to needs frustration[10]. Referred to  
67 as a controlling motivational style, social agents can thwart the three psychological needs  
68 through the controlling use of rewards (i.e., extrinsic rewards and praise), conditional regard

69 (i.e., withhold attention and support), intimidation (i.e., power assertive strategies to  
70 humiliate), and excessive personal control (i.e., intrusive monitoring and excessive or strict  
71 boundaries)[11]. Coach controlling motivational styles have been linked with a range of  
72 maladaptive outcomes including increased burnout[12] and stress[13]. These findings  
73 underscore the potentially stressful nature of controlling motivational styles within sporting  
74 contexts. However, to date, little work has focused on how the undermining effects of  
75 controlling environments can be buffered. Initial research suggests that mental toughness may  
76 serve to mitigate the maladaptive effects of controlling motivational styles[6], yet this  
77 hypothesis remains untested.

78 The concept of thriving is an important indicator of positive functioning that provides  
79 a conceptual thread between SDT and mental toughness[14]. Conceptualised as the opposite  
80 of languishing (e.g., stagnant, low positive affect), thriving is defined as a psychological state  
81 “marked both by a sense of learning (greater understanding and knowledge) and a sense of  
82 vitality (aliveness)” (p.537)[15]. Representing an internal gauge of cognitive and affective  
83 markers regarding how well one is doing [16], thriving fosters adaptive resource allocation,  
84 engagement with and commitment to tasks, proactivity, and performance[15,16]. With its  
85 centrality for goal-directed behaviour, mental toughness is a personal resource that should  
86 enable people to experience progress and growth[14]<sup>4</sup>. Longitudinal research with tertiary  
87 students supports the adaptive nature of mental toughness with regard to academic and social  
88 goal progress[2]. Similarly, meta-analytic data indicates that individuals are more likely to  
89 thrive when embedded in social contexts in which individuals feel volitional, capable and  
90 connected to others[17]. In contrast, when the three psychological needs are actively thwarted  
91 via controlling motivational contexts, individuals should be less likely to experience thriving.  
92 Research with male athletes[18] and a mixed-sex sample[19] revealed low and non-  
93 significant correlations between controlling coaching and vitality, whereas research with

94 female athletes supported a salient inverse association[20]. Given these equivocal findings,  
95 additional research is required to test this theoretical expectation, and extend this past work to  
96 include both cognitive (learning) and affective (vitality) dimensions of thriving.

97 The purposes of this study were to examine the association between controlling coach  
98 behaviours and thriving, and test the buffering effect of mental toughness on this relation. In  
99 so doing, we proposed three hypotheses. First, mental toughness will be positively associated  
100 with psychological experiences of thriving. Second, controlling coach behaviours will be  
101 inversely related with psychological experiences of thriving. Third, athletes' mental  
102 toughness will moderate the inverse association between their coach's controlling  
103 interpersonal style and psychological experiences of thriving, such that this effect will be  
104 weaker for individuals who report higher levels of mental toughness. We tested these  
105 hypotheses on a relatively homogenous sample of elite adolescent netballers, who represent  
106 an understudied sport within the sport psychology literature.

## 107 Methods

108 In total, 232 female netballers aged 11 to 17 years ( $14.97 \pm 1.52$ ) took part in this  
109 study. Netballers had between 1 and 15 years of experience in the sport ( $7.50 \pm 2.28$ )  
110 participating in between 1 and 10 hours of netball activities that were supervised by their  
111 coach ( $5.08 \text{ hours} \pm 2.53$ ). Athletes who were involved in elite developmental squads  
112 throughout Australia and their parents were informed about the study via email. Athletes who  
113 expressed an interest were provided with a research package including an information sheet,  
114 consent form, multi-section survey, and a reply-paid envelope. Consenting athletes returned  
115 completed surveys directly to Netball Australia. We obtained approval from the relevant  
116 university ethics committee before participant recruitment.

117 We selected instruments for this study where the validity of test scores obtained with  
118 those questionnaires is reported in the manuscripts which first presented these tools. Using

119 the multidimensional Controlling Coach Behaviours Scale[11], athletes reported their level of  
120 dis/agreement with 15 items considered reflective of four specific dimensions of coaches'  
121 controlling interpersonal style: controlling use of rewards (e.g., "My coach only  
122 rewards/praises me to make me train harder"), negative conditional regard (e.g., "My coach  
123 pays me less attention if I have displeased him/her"), intimidation (e.g., "My coach threatens  
124 to punish me to keep me in line during training"), and excessive personal control (e.g., "My  
125 coach tries to control what I do during my free time"). Responses were recorded using a 7-  
126 point scale (1 = strongly disagree to 7 = strongly agree). Consistent with recent  
127 research[13,21], we modelled coach interpersonal control as a higher-order construct for the  
128 primary analyses. Using the unidimensional Mental Toughness Inventory[2], athletes rated  
129 the extent to which 8 items were reflective of how they typically thought, felt and behaved as  
130 a netballer (e.g., "I strive for continued success" and "I am able to regulate my focus when  
131 performing tasks"). Responses were recorded using a 7-point scale (1 = false, 100% of the  
132 time to 7 = true, 100% of the time). Using an adaptation of the multidimensional Thriving at  
133 Work Scale[22], athletes reported the degree to which they experienced dimensions of  
134 vitality (5 items, e.g., "At netball, I feel alive and vital") and learning (5 items, e.g., "At  
135 netball, I find myself learning often") within the context of their netball pursuits. Responses  
136 were recorded using a 7-point scale (1 = strongly disagree to 7 = strongly agree). For each  
137 scale, a total score was created by averaging participants' responses across those items  
138 relevant to each construct.

139 The research questions were tested using latent moderated structural (LMS) models,  
140 which is considered superior to the traditional composite score approach because it produces  
141 minimally biased estimates of moderation effects that are corrected for measurement  
142 error[23]. We implemented a sequential 3-step analytical process where we tested the  
143 adequacy of: (i) the measurement model of the latent constructs (Model 0), (ii) the structural

144 model excluding latent interactions (Model 1), and (iii) the structural model including latent  
145 interactions (Model 2)[24]. A visual display of Model 2 is provided in Figure 1. For Models 0  
146 and 1, model-data fit was assessed using multiple indices and typical interpretation  
147 guidelines, namely the  $\chi^2$  goodness-of-fit index, comparative fit index (CFI), Tucker-Lewis  
148 index (TLI), and root mean square error of approximation (RMSEA), with evidence of  
149 adequate fit indicated by  $CFI/TLI \geq .90$  and  $RMSEA \leq .08$ [25]. As there is no saturated  
150 reference model, conventional model-data fit statistics cannot be applied to LMS models[26].  
151 In the absence of such model fit indices, the log-likelihood ratio test ( $D$ ) can be used to  
152 compare the relative fit of Models 1 and 2[23,24]. A composite reliability coefficient ( $\omega$ )[27]  
153 was calculated to estimate the level of internal reliability for each latent factor. We performed  
154 all analyses within *Mplus* 7.4[28] using a robust maximum likelihood estimator (MLR) and  
155 full information maximum likelihood (FIML) to ensure that all available data was used to  
156 estimate model parameters. All *Mplus* output files and associated syntaxes are available in  
157 the supplementary material.

## 158                   Results

159                   Descriptive statistics and bivariate correlations for all study variables are provided in  
160 Table 1; full details at each stage of the analysis are provided in the supplementary material.  
161 Models 0 and 1 represented an adequate fit with the data,  $\chi^2(485) = 771.37, p < .001$ , CFI =  
162 .921, TLI = .915, RMSEA = .050 (90% CI = .044 to .057). In terms of composite reliability  
163 estimates, mental toughness ( $\omega = .85$ ), coach controlling interpersonal style ( $\omega = .95$ ),  
164 learning ( $\omega = .84$ ), and vitality ( $\omega = .79$ ) were deemed satisfactory. Using a  $\chi^2$  distribution,  
165 the log-likelihood ratio test,  $D(2) = 7.06, p < .05$ , indicated that Model 1 resulted in a  
166 significant loss in fit relative to Model 2. For the learning dimension of thriving, mental  
167 toughness ( $B = .49, 95\% CI = .32, .65$ ), coach controlling interpersonal style ( $B = -.33, 95\%$   
168  $CI = -.50, -.16$ ), and their interaction ( $B = .28, 95\% CI = .01, .54$ ) were salient determinants.

169 As depicted in Figure 2 and established via simple slope analysis, the inverse effect of  
170 controlling coaching on experiences of learning was stronger when mental toughness was  
171 lower ( $B = -.54$ , 95% CI =  $-.88, -.20$ ) but not when higher ( $B = -.12$ , 95% CI =  $-.28, .04$ ).  
172 With regard to the vitality component of thriving, the effects of mental toughness ( $B = .64$ ,  
173 95% CI =  $.44, .85$ ) and coach controlling interpersonal style ( $B = -.24$ , 95% CI =  $-.40, -.09$ )  
174 were significant, but not their interaction ( $B = .15$ , 95% CI =  $-.10, .40$ ). The inverse  
175 association between mental toughness and coach controlling interpersonal style was small  
176 and statistically non-significant ( $B = -.11$ , 95% CI =  $-.22, .01$ ). The inclusion of the latent  
177 interaction term accounted for additional 5% and 2% of the explained variance in learning  
178 (Model 1 = 41%, Model 2 = 46%) and vitality (Model 1 = 49%, Model 2 = 51%).

## 179 Discussion

180 Drawing from motivational theory[7,8], we examined controlling coach interpersonal  
181 styles as a contextually salient stressor within sporting contexts[13,14] that may impede the  
182 degree to which athletes experience thriving, and the buffering effects of mental toughness.  
183 Consistent with expectations, we found that (i) controlling coach behaviours were inversely  
184 related with experiences of vitality and learning; (ii) mental toughness was positively  
185 associated with psychological experiences of both dimensions of thriving; and (iii) mental  
186 toughness moderated the effect of coach's controlling interpersonal style on learning but not  
187 vitality experiences.

188 Our findings align with past work that has underscored the maladaptive nature of  
189 controlling coach interpersonal styles[10]. Controlling coach behaviours have been associated  
190 with increased burnout via athlete perfectionism and motivational regulations[18], and  
191 psychological needs satisfaction and frustration[19]. In a three-wave, season long  
192 investigation of adolescent soccer players, controlling coach interpersonal style was  
193 associated with reductions in psychological need satisfaction and engagement[21]. Coach

194 controlling style has been shown to be inversely associated with mental toughness via  
195 psychological need frustration[6]. Our results add to this work to support a direct association  
196 with thriving, such that athletes who experienced higher levels of controlling coach  
197 behaviours reported fewer experiences of learning (cognitive) and vitality (affective). The  
198 reasons why coaches might adopt controlling interpersonal styles are diverse and can be  
199 broadly classified as pressures from above (e.g., organisational accountability and  
200 responsibility for performance outcomes of athletes and teams), below (e.g., athletes who are  
201 disengaged, disruptive, poorly motivated) and within (e.g., dispositional tendency towards  
202 controlling behaviours)[29].

203 Aligned with recent work[2,4,30], our findings provided additional support for the  
204 adaptive nature of mental toughness for positive functioning. We found moderate-to-large  
205 associations between mental toughness and psychological experiences of learning and  
206 vitality. These findings confirm past work that has demonstrated longitudinally the salience  
207 of mental toughness for thriving among university students over the course of a 12-week  
208 teaching semester[2]. Collectively, our results and those of previous work provide  
209 accumulating evidence for the expectation that mental toughness provides an important  
210 foundation upon which to experience a sense of feeling energised and making progress  
211 towards valued goals in achievement contexts[14].

212 The primary contribution of this study is that controlling coach interpersonal styles  
213 may not influence all athletes equally. Specifically, we focused on mental toughness as an  
214 individual difference variable that may alter the strength of the association between  
215 controlling coach behaviours and important or valued outcomes. Past work has supported the  
216 protective effects of mental toughness on life stress. In American college footballers, mental  
217 toughness moderated the effect of positive life stress (but not negative life stress) on the  
218 number of days missed due to injury, such that footballers with lower levels of mental

219 toughness missed more days to injury when stress was high[4]. This work provided an  
220 important first look at the role of mental toughness on *cross-contextual effects* from life stress  
221 to an outcome variable specific to sporting contexts (i.e., injury). Extending this past work,  
222 we examined the salience of mental toughness when both the stressor and outcome are  
223 housed within the contextual boundaries of sport. Consistent with our expectation, the inverse  
224 association between controlling coach interpersonal style and experiences of thriving was  
225 stronger for athletes lower in mental toughness. However, mental toughness buffered the  
226 effect for the learning dimension of thriving only, that is, experiencing a sense of  
227 improvement and progress towards important and valued goals[15,16,22]. This finding  
228 corroborates the conceptualisation of mental toughness as a personal resource that reflects  
229 one's psychological capacity to behave successfully in goal-directed ways[2]. The centrality  
230 of mental toughness for self-actualisation (i.e., fulfilment of potential)[14] offers insight into  
231 this differential effect in that it provides direction towards self-referenced objectives, aligns  
232 behaviour with these goals, and fosters flexibility when faced with stressful or challenging  
233 contexts[2,14,30]. As such, mental toughness is a psychological resource that is more  
234 relevant for progress and development (the 'doing' part of thriving) than it is for positive  
235 emotions associated with those processes (the 'being' part of thriving).

236 As is the case with all research, this study is not without limitation. First, the cross-  
237 sectional design does not permit inferences regarding temporal or causal associations; future  
238 research could adopt longitudinal or experimental approaches to provide stronger insight into  
239 the dynamic aspects of the relations among controlling interpersonal styles, mental toughness  
240 and thriving in sport. Second, our focus on adolescent female netballers limits the extent to  
241 which these findings may be considered representative of broader athlete populations; future  
242 research is required to ascertain the extent to which these findings can be replicated in other  
243 sporting contexts, and extended via an understanding of the moderating effect of sex.

244     **Conclusions**

245         This study corroborates previous findings regarding the maladaptive nature of  
246         controlling interpersonal styles within achievement contexts, and provides one of the first  
247         tests of how controlling environments can be buffered. In so doing, we extend past work and  
248         theory to show that mental toughness may enable athletes to counteract the potentially  
249         deleterious effect of controlling interpersonal styles. Additional research is required to  
250         confirm our findings and extend understanding of the dynamic nature of the relations  
251         between these personal and contextual factors.

252     **Practical Implications**

- 253         • The deleterious effects of controlling coach interpersonal styles on important or valued  
254         outcomes such as thriving is less for those individuals with higher levels of mental toughness.
- 255         • Understanding why coaches employ controlling interpersonal behaviours is an important  
256         first step to reducing the frequency with which such strategies are relied upon to motivate  
257         athletes.
- 258         • There is a need to identify how athletes can sustain mental toughness when faced with  
259         controlling interpersonal environments

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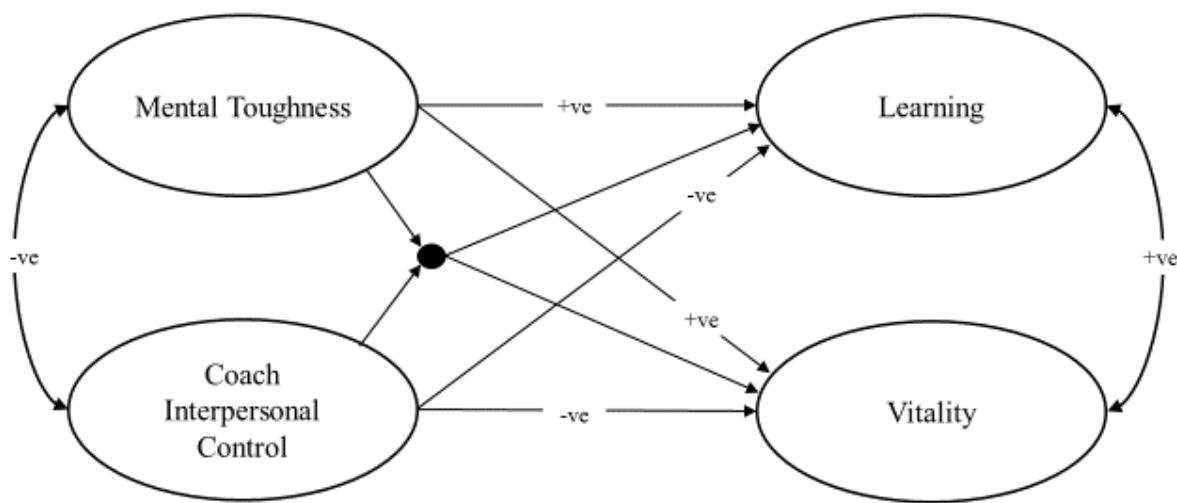
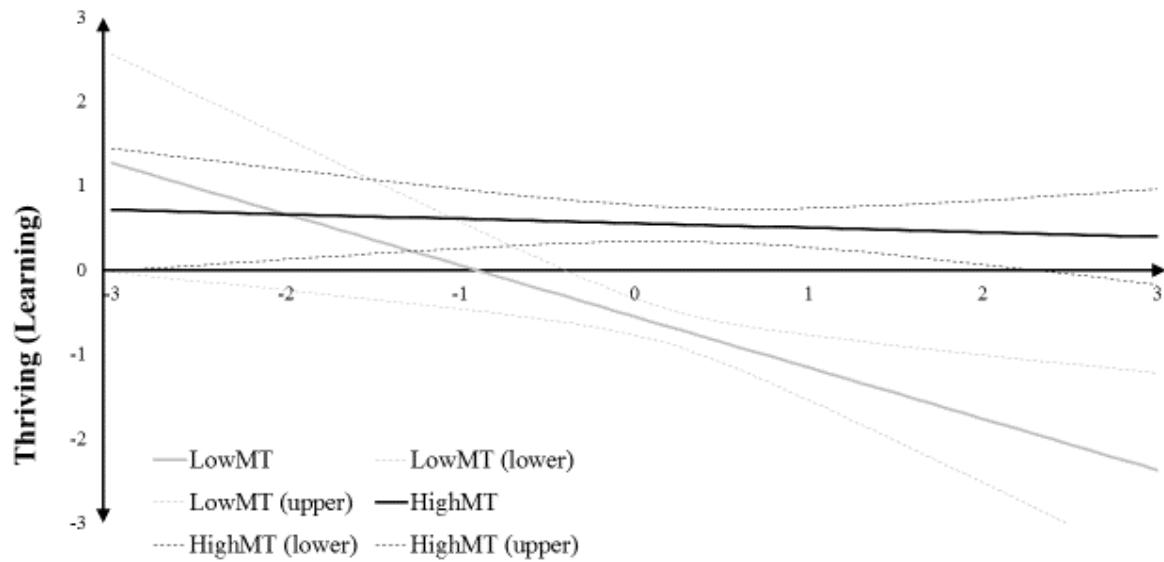


Figure 1. Diagrammatic representation of Model 2 including latent interaction between mental toughness and coach controlling interpersonal style (represented by a filled circle as per *Mplus* notation). Note: item indicators and residual variances are excluded for visual clarity; +ve = positive association expected; -ve = negative association expected.



*Figure 2.* Latent interaction of mental toughness on the relation between controlling coach interpersonal style and learning dimension of thriving. Note: 95% confidence intervals around the slope are captured by “lower” [e.g., LowMT (lower)] and “higher” [e.g., LowMT (higher)] dotted lines. MT = mental toughness; LowMT = -1 standard deviation of the zero mean of mental toughness; HighMT = +1 standard deviation of the zero mean of mental toughness.

Table 1. *Descriptive statistics and bivariate correlations for study variables* (Note: \*  $p < .05$ , \*\*  $p < .001$ ).

	1	2	3	4	Minimum	Maximum	M	SD	Skewness	Kurtosis
1 Mental toughness	-				2.25	7	5.62	.67	-.84	2.39
2 Controlling coach	-.14*	-			1	6.47	2.16	1.21	1.34	1.31
3 Learning	.44**	-.41**	-		2.60	7	6.10	.81	-1.18	1.67
4 Vitality	.51**	-.33**	.69**	-	2.80	7	5.83	.83	-.73	.44