

1 **Article title:**

2 Examining the Relationships among the Coaching Climate, Life Skills Development and  
3 Well-Being in Sport

4

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9

10 **Journal Title:**

11 International Journal of Sport Science and Coaching.

12

13 Cronin, D. L., & Allen, J. Examining the Relationships among the Coaching Climate, Life  
14 Skills Development and Well-Being in Sport. *International Journal of Sport Science and*

15 *Coaching* (Awaiting Volume and Issue Number). Copyright © [2018] (SAGE Publications).

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18 Cronin LD & Allen J, Examining the relationships among the coaching climate, life  
19 skills development and well-being in sport, *International Journal of Sports*  
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**26 Abstract**

27 Using Benson and Saito's<sup>1</sup> framework for positive youth development, we investigated the  
28 relationships between the coaching climate, young people's perceived life skills development  
29 within sport, and their psychological well-being. British youth sport participants ( $N = 326$ ,  
30  $M_{age} = 13.81$ , range = 11–18 years) completed a survey assessing the coaching climate,  
31 participants' perceived life skills development (teamwork, goal setting, time management,  
32 emotional skills, interpersonal communication, social skills, leadership, and problem solving  
33 and decision making) and psychological well-being (self-esteem, positive affect, and  
34 satisfaction with life). In all analyses, the coaching climate was positively related to young  
35 peoples' perceived development of life skills within sport and their psychological well-being.  
36 Total life skills development (a summative score of all eight life skills scores) was positively  
37 related to all three psychological well-being indicators – providing support for the “pile-up”  
38 effect<sup>2</sup> – and partially mediated the relationships between the coaching climate and  
39 participants' psychological well-being. Interpretation of the results indicated that coaches  
40 should foster the development of multiple life skills in youth sport participants, as they are  
41 associated with participants' psychological well-being. One way this can be achieved is  
42 through autonomy-supportive coaching behaviours.

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**49 Keywords**

50 Positive youth development, psychosocial development, mediation analysis, youth sport

## 51 **Introduction**

52 Over the last twenty five years a new vision of youth development has emerged called  
53 positive youth development. At its core, positive youth development refers to strength-based  
54 and asset building approaches to developmental research in which young people are seen as  
55 ‘resources to be developed’ as opposed to ‘problems to be solved’.<sup>3</sup> Three key aspects of the  
56 positive youth development approach are the developmental climate, young peoples’ life  
57 skills development, and their psychological well-being.<sup>4,5</sup> Youth sport has long been viewed  
58 as an ideal context for youth development.<sup>6</sup> Researchers have suggested that the interactive,  
59 emotional, and social nature of sports provides opportunities for development.<sup>7,8,9</sup> Within the  
60 current study, we defined sport as an organized activity which encompasses both team and  
61 individual sports and includes regularly scheduled practices and competitions.

62 Numerous studies have demonstrated that young people develop an array of life skills  
63 through sport.<sup>10,11,12</sup> Such life skills have been defined as the skills that are required to deal  
64 with the demands and challenges of everyday life.<sup>13</sup> In line with Danish et al.<sup>14</sup>, we view life  
65 skills as behavioural, cognitive, interpersonal, and intrapersonal competencies that can be  
66 learned, developed, and refined. Using the Life Skills Scale for Sport (LSSS)<sup>15</sup>, researchers  
67 can investigate the eight most commonly cited life skills which young people are purported to  
68 develop through sport: teamwork, goal setting, time management, leadership, social skills,  
69 interpersonal communication, emotional skills, and problem solving and decision making.<sup>16</sup>  
70 Given the dominance of qualitative research within the positive youth development through  
71 sport literature<sup>6</sup> and previous difficulties in measuring life skills development within sport<sup>17</sup>,  
72 Cronin and Allen’s<sup>15</sup> development and initial validation of this scale is an important  
73 advancement for the field. This scale provides researchers with a measure to  
74 comprehensively assess eight key life skills, which have been highlighted across numerous  
75 reviews as being developed through sport.<sup>16,17</sup> Using the scale, researchers can begin to

76 thoroughly investigate both the antecedents and consequences of life skills development  
77 through sport.

78         In terms of antecedents, there has been a growing acknowledgement in recent years  
79 that coaches in particular play a central role in ensuring young peoples' life skills  
80 development through sport.<sup>10</sup> For instance, qualitative research involving underserved South  
81 African youth showed that intentionally trying to teach life skills, modelling life skills, and  
82 promoting group discussions are all strategies that coaches used to develop adolescents' life  
83 skills within the context of sport.<sup>11</sup> Quantitative research with Australian youth soccer  
84 players found that the coach-athlete relationship and a coach's transformational leadership  
85 behaviours were positively related to the development of personal and social skills, cognitive  
86 skills, goal setting, and initiative.<sup>18</sup> Similarly, a study with American youths playing  
87 baseball/softball found that a mastery-oriented and caring coaching climate was related to  
88 participants' development of the same set of life skills.<sup>19</sup>

89         Another way in which the climate created by the coach has been conceptualised is in  
90 terms of autonomy support. Autonomy support is part of self-determination theory<sup>20</sup> and  
91 refers to the coach: providing choice to athletes, acknowledging athletes' feelings and  
92 perspectives, providing opportunities for initiative taking and independent work, and  
93 delivering competence feedback.<sup>21</sup> Interestingly, past research highlighted that aspects of  
94 autonomy support such as empowerment, independence, and a recognised voice were key  
95 attributes of 60 community-based youth development programmes that successfully  
96 promoted young peoples' development.<sup>22</sup> In this regard, Occhino et al.<sup>23</sup> suggested that there  
97 is consistent positive evidence for using an autonomy-supportive approach within learning  
98 contexts. Recent studies in sport have shown autonomy support to be associated with  
99 participants' life skills development. For example, a study with British youth sport  
100 participants found that coach autonomy support was related to participants' development of

101 personal and social skills, cognitive skills, goal setting, and initiative.<sup>12</sup> Another qualitative  
102 study found that effective American youth sport coaches use autonomy support to promote  
103 athletes' life skills development.<sup>24</sup>

104 Past studies in sport and physical education have also found that coaches' or teachers'  
105 autonomy-supportive behaviours are positively associated with participants' psychological  
106 well-being, as indicated by higher self-esteem, positive affect, and life satisfaction.<sup>12,25,26</sup>  
107 Within sport, little is known about the role of life skills development in gaining these positive  
108 outcomes. The current study focused on the outcome of psychological well-being and like  
109 previous research assessed this construct using measures of self-esteem, positive affect, and  
110 satisfaction with life.<sup>26,27</sup> Self-esteem was defined as "a person's evaluation of, or attitude  
111 toward, him- or herself" (p. 435);<sup>28</sup> positive affect is "the extent to which an individual  
112 experiences pleasurable engagement with the environment" (p. 246);<sup>29</sup> and satisfaction with  
113 life was defined as "a global assessment of a person's quality of life according to his/her  
114 chosen criteria" (p. 478).<sup>30</sup> To date, only one study involving 202 British youth sport  
115 participants<sup>12</sup> has examined the relationships between participants' life skills development  
116 within sport and their psychological well-being. This study found that personal and social  
117 skills development through sport was related to participants' self-esteem, positive affect, and  
118 satisfaction with life. In contrast, cognitive skills, goal setting, and initiative were unrelated  
119 to participants' psychological well-being. However, using the LSSS<sup>15</sup> it is important to  
120 assess if the development of a wider range of life skills through sport is associated with  
121 participants' psychological well-being.

122 Individual life skills, along with a range of life skills, are important for young  
123 peoples' development. In this regard, Benson<sup>2</sup> proposed that the more strengths or life skills  
124 a young person possesses, the better off they will be on a variety of other outcomes – this has  
125 been termed the "pile-up" effect. Extensive reviews of the youth development literature

126 outside of sport have supported the idea of a “pile-up” effect, with the total number of  
127 strengths young people possess being positively related to academic, behavioural, and well-  
128 being outcomes.<sup>31</sup> Research within physical education has also shown that students’ total life  
129 skills development within physical education is consistently associated with their  
130 psychological well-being.<sup>25</sup> These findings fit with the untested premise that the more life  
131 skills young people learn through sport, the more likely they will develop in a positive  
132 manner.<sup>32</sup>

133 In their framework for youth development theory and research, Benson and Saito<sup>1</sup>  
134 proposed that youth development inputs (e.g., the coaching climate) serve to develop young  
135 peoples’ strengths (e.g., their life skills), and the development of these strengths promote  
136 other well-being outcomes. This conceptual framework was proposed to promote “the  
137 systematic inquiry necessary to guide, shape, refine, and fuel the [positive youth  
138 development] approach” (p. 143).<sup>1</sup> The overarching framework is useful as it allows  
139 researchers to investigate the relationships between three key aspects of positive youth  
140 development: the developmental climate, life skills development, and participants’ well-  
141 being.<sup>4,5</sup> Benson and Saito’s<sup>1</sup> framework is similar to recently proposed models of positive  
142 youth development through sport<sup>17</sup> and life skills transfer from sport to other life domains.<sup>33</sup>  
143 Specifically, these models also highlight that the coaching climate is related to participants’  
144 life skills development and that life skills development is related to other positive outcomes.

145 The overall purpose of this study was to investigate the relationships between coach  
146 autonomy support, participants’ perceived life skills development within sport, and their  
147 psychological well-being. The first aim of the study was to examine whether British youth  
148 sport participants were developing the eight life skills. Consistent with a review of the  
149 research literature<sup>16</sup> – which included research predominantly from North America – it was  
150 expected that participants would report developing these life skills. The second aim was to

151 investigate whether developing each of the eight life skills, along with the whole set of life  
152 skills (i.e., “pile-up” effect), was positively related to participants’ self-esteem, positive  
153 affect, and satisfaction with life. In line with previous research,<sup>25,31</sup> we expected some  
154 individual life skills and total life skills to be related to participants’ self-esteem, positive  
155 affect, and satisfaction with life. The third aim was to assess whether coach autonomy  
156 support was positively related to each of the eight life skills. Based on previous studies in  
157 youth sport,<sup>15,24</sup> it was anticipated that coach autonomy support would be positively related to  
158 each of the life skills. The final aim was to assess whether life skills development mediated  
159 the relationships between coach autonomy support and participants’ psychological well-  
160 being. Based on Benson and Saito’s<sup>1</sup> framework, it was expected that life skills development  
161 would mediate the relationships between coach autonomy support and participants’  
162 psychological well-being.

## 163 **Method**

### 164 *Participants*

165 In total, 326 British youth sports participants ( $M_{\text{age}} = 13.81$ ,  $SD = 1.52$ , age range =  
166 11–18 years) from club (72.7%) and school (27.3%) sports took part in the research. The  
167 sample had more male ( $n = 188$ ) than female participants ( $n = 138$ ). Participants’ main sport  
168 included football ( $n = 80$ ), dance ( $n = 44$ ), rugby ( $n = 36$ ), field hockey ( $n = 24$ ), basketball ( $n$   
169 = 22), track and field ( $n = 15$ ), gymnastics ( $n = 14$ ), swimming ( $n = 13$ ), and taekwondo ( $n =$   
170 11). In total, 67 respondents took part in 29 other sports (e.g., horse riding, badminton, golf).  
171 Participants had taken part in their main sport for an average of 5.74 years ( $SD = 3.65$ ), spent  
172 an average of 4.13 hours per week participating in their sport ( $SD = 3.74$ ), and were coached  
173 by their current coach for an average of 2.84 years ( $SD = 2.97$ ). Apart from their main sport,  
174 participants took part in between 0–6 other sports ( $M = 0.88$ ,  $SD = 1.13$ ).

### 175 *Procedures*

176           Following approval from the university's ethics committee, participants were  
177 recruited from local schools. Prior to participation, written informed consent was obtained  
178 from the participant's parent or guardian, if they were less than 16 years old. All participants  
179 also signed a written informed consent form prior to completing the paper-and-pencil survey.  
180 Participants completed the survey after the researcher explained the purpose of the study, that  
181 participants' were to respond to all questions in relation to their main sport, that there were no  
182 right or wrong answers, and that all information was anonymous and would be kept  
183 confidential. The survey took approximately 15–20 minutes to complete.

#### 184 *Measures*

185           *Coach autonomy support.* Perceptions of coach autonomy support were assessed with  
186 the 6-item version of the Sport Climate Questionnaire.<sup>34</sup> This questionnaire allows athletes to  
187 rate their coach in terms of autonomy support. Example items include “I feel understood by  
188 my coach” and “My coach listens to how I would like to do things.” Each item is rated on a  
189 7-point scale ranging from 1 (*Strongly disagree*) to 7 (*Strongly agree*). The scale has  
190 previously displayed adequate reliability and validity with adolescents.<sup>35</sup> In the current  
191 sample, the scale displayed a Cronbach's alpha coefficient of .94, which was above the .70  
192 deemed necessary for the psychological domain.<sup>36</sup>

193           *Life skills development.* The 43-item LSSS<sup>15</sup> was used to measure participants'  
194 perceived life skills development through sport. Participants were asked to “rate how much  
195 your sport has taught you to perform the skills listed below.” The stem for each question was  
196 “This sport has taught me to...” and responses were provided on a 5-point scale ranging from  
197 1 (*Not at all*) to 5 (*Very much*). Example items included: *teamwork* (7 items; “work well  
198 within a team/group”), *goal setting* (7 items; “set specific goals”), *time management* (4 items;  
199 “manage my time well”), *emotional skills* (4 items; “use my emotions to stay focused”),  
200 *interpersonal communication* (4 items; “communicate well with others”), *social skills* (5

201 items; “interact in various social settings”), *leadership* (8 items; “organise team/group  
202 members to work together”), and *problem solving and decision making* (4 items; “think  
203 carefully about a problem”). Previous research provided evidence for the validity and  
204 reliability of this scale with youth sport participants.<sup>15</sup> In the current sample, each of the  
205 subscales of the LSSS and total life skills displayed adequate internal consistency reliability  
206 with alpha coefficients ranging from .81–.96. Within the supplementary materials, we also  
207 provide evidence (i.e., fit indices and factor loadings) for the factorial validity of this  
208 relatively new scale.

209         *Self-esteem.* Self-esteem was measured using the general-self subscale of the Self-  
210 Description Questionnaire II.<sup>37</sup> Five items of the subscale are phrased positively (e.g., “Most  
211 things I do, I do well”) and five items are written to reflect low self-esteem (e.g., “Overall, I  
212 am a failure”). Participants respond on a 7-point scale ranging from 1 (*False*) to 7 (*True*).  
213 The construct validity and reliability of the scale has been supported with adolescents inside  
214 and outside of sport.<sup>27,37</sup> The alpha coefficient was .84 for the current sample.

215         *Positive affect.* Positive affect was assessed using the positive subscale of the Positive  
216 and Negative Affect Schedule.<sup>38</sup> This 10-item scale asks participants to rate how a word  
217 (e.g., “inspired” or “active”) describes their feelings “in general.” The participants rate the  
218 extent to which they feel that way on a 5-point scale ranging from 1 (*Very slightly or not at*  
219 *all*) to 5 (*Extremely*). This scale has displayed adequate reliability and factorial validity with  
220 youth sport participants.<sup>39</sup> The current sample displayed an alpha coefficient of .89.

221         *Satisfaction with life.* Satisfaction with life was measured using the Satisfaction With  
222 Life Scale.<sup>40</sup> This 5-item scale asks participants to indicate their agreement with certain  
223 statements (e.g., “I am satisfied with life”). Participants respond on a 7-point scale ranging  
224 from 1 (*Strongly disagree*) to 7 (*Strongly agree*). This scale has displayed adequate factorial

225 validity and reliability with adolescents.<sup>41</sup> The alpha coefficient was .87 for the current  
226 sample.

### 227 *Strategy for Mediation Analyses*

228         The mediation hypotheses were tested for all three dependent variables: self-esteem,  
229 positive affect, and satisfaction with life. For this task, we employed non-parametric  
230 bootstrapping analysis<sup>42</sup> which allows one to estimate direct and indirect effects in models  
231 with multiple mediators and has been shown to perform better than other techniques in terms  
232 of statistical power and Type I error control.<sup>43</sup> To test for mediation, we used the PROCESS  
233 macro for SPSS<sup>42</sup> with 20,000 bootstrap resamples and 95% bias corrected confidence  
234 intervals (CIs). There is evidence of mediation, or a specific indirect effect, when zero is not  
235 included within the lower and upper bound CIs. Previous studies have tested for mediation  
236 using this approach.<sup>44</sup>

## 237 **Results**

### 238 *Preliminary Analysis*

239         Three participants had more than 5% missing data and were therefore deleted from  
240 the sample. For the remaining sample ( $N = 323$ ), of the 74 items each individual item was  
241 left blank an average of 5.53 times across the whole sample ( $SD = 1.19$ ; range = 0–14).  
242 Missing data analysis revealed no pattern to these missing values, rather the data was missing  
243 at random. As the percentage of missing data was low (1.71%) and we wanted to minimise  
244 lost data, a mean substitution was performed. Mean substitution is a valid approach when a  
245 small percentage of data is missing from a moderately sized sample.<sup>45</sup> Prior to conducting  
246 the main analyses, the data were screened for normality. Skewness values ranged from -1.42  
247 to -0.27 and kurtosis values ranged from -0.55 to 3.01, indicating reasonable normality.<sup>45</sup>

### 248 *Descriptive Statistics*

249 Table 1 presents the means, scale ranges, standard deviations, reliability coefficients,  
250 and correlations for all variables. The mean score for coach autonomy support was 5.64 on  
251 the 1–7 scale, indicating that participants felt their coaches were displaying high levels of  
252 autonomy support. The mean scores on the 1–5 response scale of the LSSS were as follows:  
253 teamwork (4.04), interpersonal communication (3.99), social skills (3.96), goal setting (3.87),  
254 leadership (3.83), time management (3.69), emotional skills (3.59), and problem solving and  
255 decision making (3.47). Based on these scores, one could conclude that participants were  
256 learning at least ‘some’ (3 on the response scale) life skills and at most ‘a lot’ (4 on the  
257 response scale) of life skills through sport. The mean scores for the psychological well-being  
258 indicators were: 4.66 on the 1–6 scale for self-esteem, 4.19 on the 1–5 scale for positive affect,  
259 and 5.36 on the 1–7 scale for satisfaction with life. These scores meant that participants  
260 scored highly on each of the psychological well-being indicators. Overall, the correlations  
261 revealed that the relationships between coach autonomy support and the eight life skills, along  
262 with the three psychological well-being indicators, were significant and positive. In general,  
263 each of the eight life skills and total life skills were positively related to participants’ self-  
264 esteem, positive affect, and satisfaction with life.

### 265 *Main Analyses*

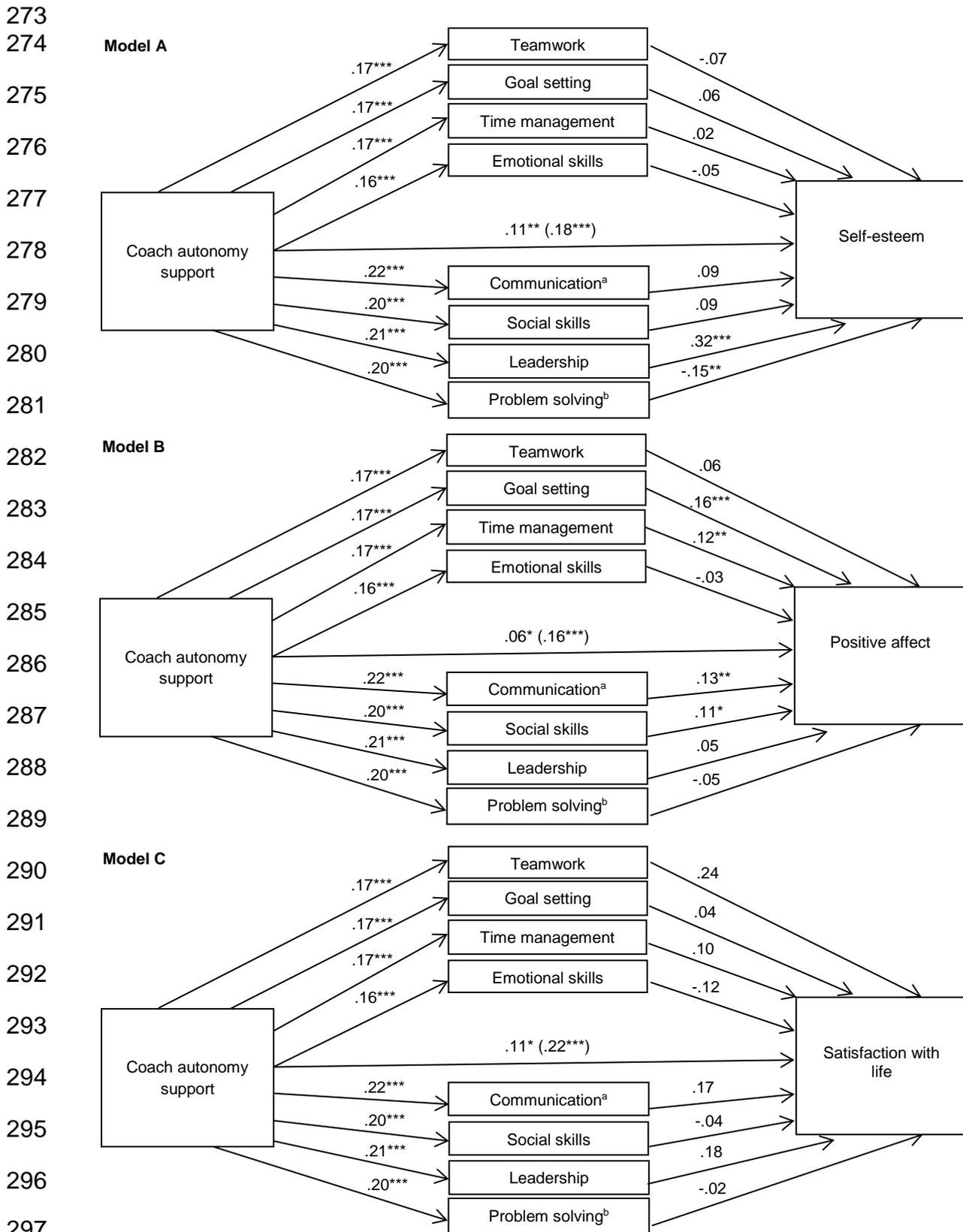
266 Figure 1 displays unstandardized regression coefficients for each of the three  
267 mediation models. Within the mediational models, we controlled for evident gender, sport  
268 type, and age group differences (see supplementary materials for details of these differences).  
269 In all models, coach autonomy support was included as the independent variable. Teamwork,  
270 goal setting, time management, emotional skills, interpersonal communication, social skills,  
271 leadership, and problem solving and decision making were included as parallel mediators.  
272 Model A included self-esteem as the dependent variable, Model B had positive affect as the

**Table 1.** Summary of Intercorrelations, Scale Ranges, Means, Standard Deviations and Reliability Estimates

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Autonomy support	–												
2. Teamwork	.35***	–											
3. Goal setting	.29***	.40***	–										
4. Time management	.25***	.30***	.54***	–									
5. Emotional skills	.20***	.35***	.46***	.54***	–								
6. Communication <sup>a</sup>	.34***	.40***	.37***	.50***	.45***	–							
7. Social skills	.34***	.49***	.39***	.41***	.46***	.59***	–						
8. Leadership	.37***	.54***	.51***	.52***	.46***	.58***	.62***	–					
9. Problem solving <sup>b</sup>	.25***	.36***	.48***	.51***	.52***	.47***	.45***	.54***	–				
10. Total life skills	.41***	.66***	.73***	.72***	.71***	.72***	.74***	.84***	.73***	–			
11. Self-esteem	.28***	.18**	.18**	.17**	.11*	.27***	.26***	.33***	.09	.28***	–		
12. Positive affect	.33***	.34***	.43***	.43***	.31***	.45***	.42***	.43***	.31***	.53***	.34***	–	
13. Life satisfaction	.26***	.23***	.21***	.23***	.09	.27***	.19**	.27***	.15**	.28***	.45***	.33***	–
Scale range	1–7	1–5	1–5	1–5	1–5	1–5	1–5	1–5	1–5	1–5	1–6	1–5	1–7
Mean	5.64	4.04	3.87	3.69	3.59	3.99	3.96	3.83	3.47	3.83	4.66	4.19	5.36
Standard deviation	1.36	0.67	0.86	0.98	1.07	0.89	0.84	0.81	1.04	0.64	0.85	0.66	1.21
Cronbach's alpha	.94	.83	.91	.89	.89	.81	.85	.91	.91	.96	.84	.89	.87

Note. <sup>a</sup>Refers to interpersonal communication skills. <sup>b</sup>Refers to problem solving and decision making skills.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$



**Figure 1.** Regression models predicting self-esteem (model A), positive affect (model B), and satisfaction with life (model C). Values signify unstandardized regression coefficients. The direct effect of coach autonomy support on the dependent variable is outside the parentheses. The total effect is inside the parentheses. Gender, sport type, and age group were included as covariates in all three models.

<sup>a</sup>Refers to interpersonal communication skills. <sup>b</sup>Refers to problem solving and decision making skills.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

304 dependent variable, and Model C included satisfaction with life as the dependent variable.  
 305 Results of the indirect effects are presented in Table 2, which tells us whether there is a total  
 306 indirect effect and what effect (if any) each of the mediators are having. The total indirect  
 307 effect also represents the indirect effect of total life skills development, as it is the sum of the

**Table 2.** Indirect Effects of Coach Autonomy Support on Psychological Well-being (Self-Esteem, Positive Affect and Satisfaction With Life) Through Each Mediator

	Bootstrap effect	Normal effect	Normal theory tests			95% CI
			SE	z	p	
<b>Self-esteem</b>						
Total effect	.07					[.03, .11]
Teamwork	-.01	-.01	.02	-0.79	.43	[-.05, .02]
Goal setting	.01	.01	.01	0.80	.43	[-.01, .03]
Time management	.003	.003	.01	0.23	.82	[-.02, .02]
Emotional skills	-.01	-.01	.01	-0.89	.37	[-.03, .01]
Communication <sup>a</sup>	.02	.02	.02	1.30	.19	[-.01, .05]
Social skills	.02	.02	.02	1.13	.26	[-.02, .05]
Leadership	.07	.07	.02	3.28	.001	[.03, .13]
Problem solving <sup>b</sup>	-.03	-.03	.01	-2.27	.02	[-.06, -.01]
Model	$F(12, 310) = 5.58^{***}, R^2 = .18$					
<b>Positive affect</b>						
Total effect	.10					[.06, .16]
Teamwork	.01	.01	.01	0.98	.33	[-.02, .04]
Goal setting	.03	.03	.01	2.79	.01	[.01, .05]
Time management	.02	.02	.01	2.22	.03	[.01, .04]
Emotional skills	-.01	-.01	.01	-0.79	.43	[-.02, .01]
Communication <sup>a</sup>	.03	.03	.01	2.43	.02	[.01, .06]
Social skills	.02	.02	.01	2.01	.05	[-.002, .06]
Leadership	.01	.01	.01	0.78	.43	[-.02, .04]
Problem solving <sup>b</sup>	-.01	-.01	.01	-1.16	.25	[-.03, .01]
Model	$F(12, 310) = 13.45^{***}, R^2 = .34$					
<b>Satisfaction with life</b>						
Total effect	.11					[.05, .20]
Teamwork	.04	.04	.02	1.90	.06	[-.003, .10]
Goal setting	.01	.01	.02	0.42	.68	[-.03, .05]
Time management	.02	.02	.02	1.03	.30	[-.01, .06]
Emotional skills	-.02	-.02	.01	-1.41	.16	[-.06, .01]
Communication <sup>a</sup>	.04	.04	.02	1.69	.09	[-.01, .10]
Social skills	-.01	-.01	.02	-0.35	.72	[-.06, .03]
Leadership	.04	.04	.03	1.48	.14	[-.02, .11]
Problem solving <sup>b</sup>	-.004	-.004	.02	-0.24	.81	[-.04, .03]
Model	$F(12, 310) = 5.05^{***}, R^2 = .16$					

Note. Bootstrap generated confidence intervals. CI = confidence interval.

<sup>a</sup>Refers to interpersonal communication skills. <sup>b</sup>Refers to problem solving and decision making skills.

\*\*\* $p < .001$ .

308 indirect effects for each mediator. Finally, Figure 2 displays the mediation model when total  
309 life skills was included as a sole mediator.

310 The mediation models in Figure 1 showed that coach autonomy support was  
311 positively related to all eight mediators: teamwork, goal setting, time management, emotional  
312 skills, interpersonal communication, social skills, leadership, and problem solving and  
313 decision making. However, consistent relationships were not seen between each of the eight  
314 life skills and the psychological well-being indicators. Only leadership was positively related  
315 and problem solving and decision making negatively related to self-esteem. Goal setting,  
316 time management, interpersonal communication, and social skills were positively associated  
317 with positive affect. Finally, none of the eight life skills were related to satisfaction with life.

318 The first model included self-esteem as the dependent variable (Figure 1, Model A).  
319 Within this model, the total effect of coach autonomy support on self-esteem was significant.  
320 When the mediators were entered into the model, the direct effect of coach autonomy support  
321 on self-esteem was reduced but still significant, suggesting partial mediation. Of the  
322 proposed mediators (see Table 2), leadership along with problem solving and decision  
323 making displayed significant indirect effects. Total life skills development also displayed a  
324 significant indirect effect.

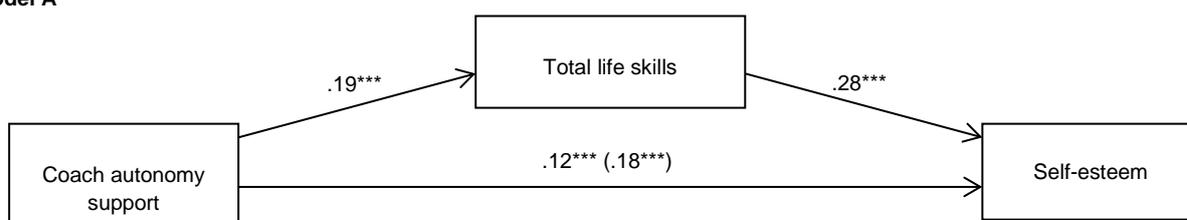
325 The second model included positive affect as the dependent variable (Figure 1, Model  
326 B). Within this model, the total effect of coach autonomy support on positive affect was  
327 significant. When the mediators were included, the direct effect of coach autonomy support  
328 on positive affect was still significant although reduced, suggesting partial mediation. Of the  
329 proposed mediators (see Table 2), goal setting, time management, and interpersonal  
330 communication displayed significant indirect effects. Again, total life skills development  
331 displayed a significant indirect effect.

332 The third model included satisfaction with life as the dependent variable (Figure 1,

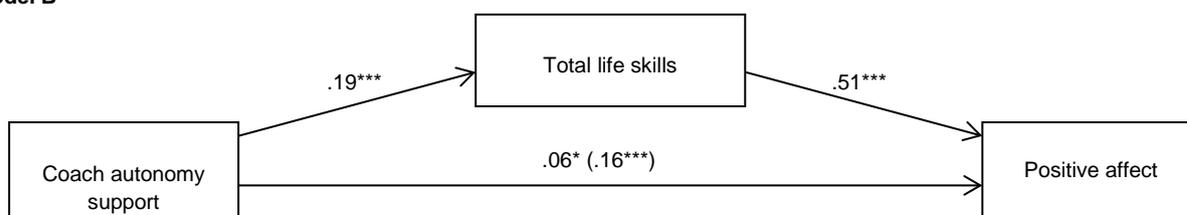
333 Model C). Within this model, the total effect of coach autonomy support on satisfaction with  
 334 life was significant. When the mediators were entered into the model, the direct effect of  
 335 coach autonomy support on satisfaction with life was reduced but still significant, suggesting  
 336 partial mediation. Of the proposed mediators (see Table 2) none of the individual life skills  
 337 displayed a significant indirect effect; whereas, total life skills development did display a  
 338 significant indirect effect.

339 As total life skills development consistently displayed significant indirect effects, we  
 340 ran three models which included total life skills as a mediator (Figure 2, Models A–C). The  
 341 three models showed that coach autonomy support was positively related to total life skills  
 342 development. Total life skills development was positively related to self-esteem, positive

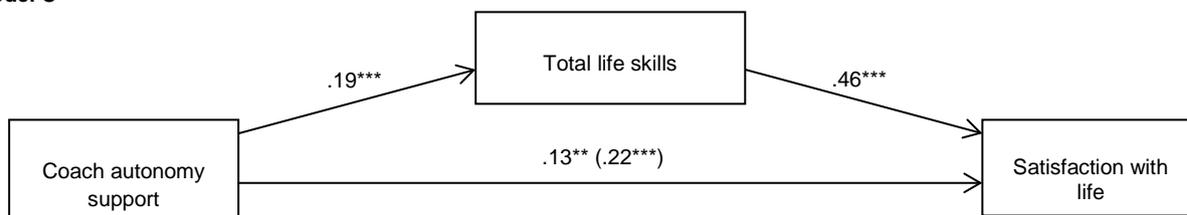
343 **Model A**



349 **Model B**



355 **Model C**



359 **Figure 2.** Regression models predicting self-esteem (Model A), positive affect (Model B) and satisfaction with life (Model C).  
 360 Values signify unstandardized regression coefficients. The direct effect of coach autonomy support on each indicator of  
 361 psychological well-being are outside parentheses. The total effects are inside parentheses. Gender, sport type, and age group  
 362 were included as covariates in all three models.

363 \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .  
 364  
 365

366 affect, and satisfaction with life. Lastly, when total life skills development was entered as a  
367 mediator, the direct effect of coach autonomy support on self-esteem, positive affect, and  
368 satisfaction with life was reduced but still significant, suggesting partial mediation.

### 369 **Discussion**

370         Alongside previous research, this study forms a persuasive argument that sports  
371 help young people to develop their life skills. Specifically, the findings from this study  
372 confirmed the results of a review paper<sup>16</sup>, which reported that young people perceive they  
373 develop the following life skills through sport: teamwork, goal setting, time management,  
374 emotional skills, interpersonal communication, social skills, leadership, and problem  
375 solving and decision making. When compared to the research in physical education,<sup>25</sup> it  
376 seems that youth sport participants perceive they develop the same eight life skills, but to a  
377 greater extent than students within physical education classes.

378         Within the current study, it was promising that the LSSS<sup>15</sup> proved a reliable and  
379 valid measure of life skills development. This is particularly the case given the dominance  
380 of qualitative research within the literature<sup>6</sup> and past difficulties in measuring life skills  
381 development within sport.<sup>17</sup> Our findings should encourage other researchers to utilise the  
382 LSSS when investigating life skills development through sport. Coaches or practitioners  
383 delivering sports-based youth development programs (e.g., Sport United to Promote  
384 Education and Recreation; SUPER)<sup>46</sup> and sport for development and peace programs (e.g.,  
385 Grassroot Soccer)<sup>47</sup> could also use the LSSS to evaluate the targeted outcomes of their  
386 programs. For instance, the LSSS could be used to assess the development of teamwork,  
387 goal setting, communication, problem solving, and emotional skills, which are targeted  
388 outcomes of the SUPER program<sup>46</sup>, and leadership skills, which is a key outcome of the  
389 Grassroot Soccer program.<sup>47</sup> This would seem a particularly important endeavour given  
390 the lack of critical evaluation of such programs.<sup>48,49</sup>

391           Researchers from both sport<sup>32</sup> and developmental psychology<sup>2</sup> have suggested that  
392 the more life skills young people possess, the more likely they will develop in a positive  
393 manner. Similar to findings in physical education,<sup>25</sup> results from this study supported the  
394 idea of a “pile-up” effect within youth sport, as total life skills were positively related to  
395 participants’ self-esteem, positive affect, and satisfaction with life. Based on these novel  
396 findings, researchers and practitioners should advise coaches to help participants develop a  
397 range of life skills through sport (i.e., utilize the “pile up” effect). According to the existing  
398 evidence-based literature,<sup>10,11,24</sup> coaches could utilize the following strategies in order to  
399 develop participants’ life skills: be intentional, selective, and systematic in teaching life  
400 skills; provide participants with opportunities to develop specific life skills; establish rules  
401 to follow and hold participants accountable for their actions; model the life skills they want  
402 participants to learn; use teachable moments to develop particular life skills; help  
403 participants to think for themselves; and engage participants in team/group discussions. It  
404 is also important to note that there is a body of literature on training coaches to teach life  
405 skills. For example, the SUPER program<sup>46</sup> provides guidance on how to train coaches to  
406 teach specific life skills and some recent research has outlined how coaches were trained to  
407 integrate life skills into Golf Canada’s youth programs.<sup>50</sup> Other recent studies<sup>51,52</sup> have also  
408 highlighted how technological tools such as websites or group messaging services (e.g.,  
409 WhatsApp) could be used to better train coaches on how to integrate life skills development  
410 into their practices. Despite these promising developments within the research literature,  
411 there is still a clear need for coach training programs organized by national governing  
412 bodies for sport to better prepare coaches to teach such a variety of life skills.<sup>10</sup>

413           Like Flett et al.’s<sup>24</sup> qualitative study, the current study found that coach autonomy  
414 support was positively related to participants’ development of a range of different life  
415 skills. In practice, this means that coaches should provide choice within practice/training,

416 acknowledge participants' feelings and perspectives, give a rationale for tasks, provide  
417 opportunities for initiative taking and independent work, and deliver competence  
418 feedback.<sup>21,53</sup> For the interested reader, guidance on how to train coaches to be more  
419 autonomy supportive is provided by Su and Reeve's<sup>54</sup> meta-analysis on autonomy support  
420 interventions and Mahoney et al.'s<sup>55</sup> intervention study with rowing coaches. Given our  
421 own positive findings in relation to coach autonomy support, future research focused on  
422 testing self-determination theory<sup>20</sup> should investigate whether the satisfaction of the three  
423 basic needs of autonomy, competence, and relatedness mediates the relationships between  
424 coach autonomy support and participants' life skills development. In line with Benson and  
425 Saito's<sup>1</sup> framework for youth development theory and research, future studies could also  
426 assess other aspects of the sports environment (e.g., parental behaviors or peer  
427 relationships) which may be antecedents of young peoples' life skills development.

428         In their framework, Benson and Saito<sup>1</sup> suggested that the life skills young people  
429 learn should be positively related to other well-being outcomes. For individual life skills,  
430 mediation models from this study generally suggested that this was not the case. Only a  
431 small number of life skills were positively related to the psychological well-being  
432 indicators when tested within the mediation models and one life skill showed a small  
433 negative relationship. Only leadership was positively associated with participants' self-  
434 esteem; goal setting, time management, interpersonal communication, and social skills  
435 were positively related to positive affect; and none of the life skills were associated with  
436 participants' satisfaction with life. Thus, it seems that only certain life skills developed  
437 through sport are positively related to young peoples' psychological well-being. One  
438 explanation for our findings was that competition amongst the eight mediators hindered the  
439 ability of the statistical analysis to detect possible relationships between individual life  
440 skills and the psychological well-being indicators. This is because the unique variance in

441 the dependent variable explained by the mediator is reduced when controlling for other  
442 mediators.<sup>43</sup> A second explanation for our findings is that self-esteem, positive affect, and  
443 satisfaction with life are global constructs that may be associated with some variables and  
444 not others – and are most likely to be influenced by a range of variables combined (as was  
445 the case with total life skills in the present study). This proposition is supported by past  
446 research illustrating that self-esteem is influenced by self-concept in only certain  
447 domains,<sup>56</sup> along with perceptions of the self in a range of areas combined.<sup>57</sup> Based on  
448 some initial research on life skills transference,<sup>58</sup> future studies could investigate if the  
449 eight life skills assessed via the LSSS transfer to and impact upon other specific life  
450 domains such as school work, friendships or family life. A final possible explanation for  
451 our findings is that the cross-sectional design of our study was a limiting factor. It may be  
452 the case that life skills have an effect on young peoples' psychological well-being over an  
453 extended period of time. For example, a young person low in self-esteem may learn social  
454 and interpersonal communication skills within sport over a two-year period and then show  
455 an increase in self-esteem. Therefore, follow-up studies could investigate the effect of  
456 individual life skills on psychological well-being indicators over time.

457       Regarding mediation, Benson and Saito's<sup>1</sup> framework – along with recent sports-  
458 based models<sup>17,33</sup> – suggested that life skills development should mediate the relationship  
459 between coach autonomy support and participants' psychological well-being. Like  
460 previous research,<sup>12,25,26</sup> this study showed a direct relationship between coach autonomy  
461 support and each of the psychological well-being indicators. This study also showed that  
462 individual life skills did not consistently mediate these relationships. In contrast, a novel  
463 finding of the present study was that total life skills consistently partially mediated the  
464 relationships between coach autonomy support and all three psychological well-being  
465 indicators. Again, this finding highlights the importance of coaches developing multiple

466 life skills in their participants, so as to take advantage of the “pile-up” effect.<sup>2</sup>

#### 467 *Limitations and Future Recommendations*

468         The present study had a number of limitations which need to be addressed. To begin,  
469 with self-report data there is always a concern with social desirability and the truthfulness of  
470 responses. Along with using self-report, future research could gain coaches’ or parents’  
471 perspectives to corroborate participants’ perceptions that they develop life skills through  
472 sport. As all data was collected at one time-point, common method bias could be a limitation  
473 for this study. According to Podsakoff et al.,<sup>59</sup> the use of different response formats for the  
474 independent, mediator and dependent variables in this study should have reduced possible  
475 common method bias. Future studies could reduce possible common method bias further by  
476 obtaining the independent and dependent variables from different sources or by introducing a  
477 time lag between measuring the independent and dependent variables.<sup>59</sup> Another limitation  
478 was the cross-sectional design of this study, which means that causality could not be  
479 established between variables. Nonetheless, the findings from the current study should  
480 encourage future longitudinal and intervention-based studies to investigate the causal  
481 relationships and mechanisms between the coaching climate, participants’ life skills  
482 development within sport, and their psychological well-being.

#### 483 *Conclusion*

484         In summary, this study found that British youth sport participants perceived they were  
485 developing the following life skills through sport: teamwork, goal setting, time management,  
486 emotional skills, interpersonal communication, social skills, leadership, and problem solving  
487 and decision making. Findings showed that coach autonomy support was positively related  
488 to the development of all eight life skills and total life skills were positively related to all  
489 three psychological well-being indicators – providing support for the “pile-up” effect.<sup>2</sup> In  
490 contrast, our mediation analyses found that individual life skills were not consistently related

491 to participants' psychological well-being and one life skill even displayed a small negative  
492 relationship with participants' self-esteem. In general, the findings did support Benson and  
493 Saito's framework for youth development theory and research,<sup>1</sup> which should encourage  
494 future studies to use this framework when investigating youth development through sport. In  
495 practice, the results suggest that coaches should work to ensure young people develop a range  
496 of life skills through their participation in sport. Creating an autonomy supportive climate is  
497 one way that coaches can achieve this aim and also foster young people's psychological well-  
498 being.

499

#### 500 **Funding**

501 The authors received no financial support for the research, authorship, and/or publication of  
502 this article.

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