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

4

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26 Abstract

27 Using Benson and Saito's¹ 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 effect² – 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’.³ 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.^{4,5} Youth sport has long been viewed
58 as an ideal context for youth development.⁶ Researchers have suggested that the interactive,
59 emotional, and social nature of sports provides opportunities for development.^{7,8,9} 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.^{10,11,12} Such life skills have been defined as the skills that are required to deal
64 with the demands and challenges of everyday life.¹³ In line with Danish et al.¹⁴, 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)¹⁵, 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.¹⁶
70 Given the dominance of qualitative research within the positive youth development through
71 sport literature⁶ and previous difficulties in measuring life skills development within sport¹⁷,
72 Cronin and Allen’s¹⁵ 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.^{16,17} 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.¹⁰ 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.¹¹ 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.¹⁸ 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.¹⁹

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 theory²⁰ 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.²¹ 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.²² In this regard, Occhino et al.²³ 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.¹² Another qualitative
102 study found that effective American youth sport coaches use autonomy support to promote
103 athletes' life skills development.²⁴

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.^{12,25,26}
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.^{26,27} Self-esteem was defined as "a person's evaluation of, or attitude
111 toward, him- or herself" (p. 435);²⁸ positive affect is "the extent to which an individual
112 experiences pleasurable engagement with the environment" (p. 246);²⁹ 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).³⁰ To date, only one study involving 202 British youth sport
115 participants¹² 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 LSSS¹⁵ 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, Benson² 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.³¹ 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.²⁵ 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.³²

133 In their framework for youth development theory and research, Benson and Saito¹
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).¹ 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.^{4,5} Benson and Saito’s¹ framework is similar to recently proposed models of positive
142 youth development through sport¹⁷ and life skills transfer from sport to other life domains.³³
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 literature¹⁶ – 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,^{25,31} 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,^{15,24} 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’s¹ 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.³⁴ 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.³⁵ 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.³⁶

193 *Life skills development.* The 43-item LSSS¹⁵ 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.¹⁵ 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.³⁷ 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.^{27,37} 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.³⁸ 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.³⁹ 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.⁴⁰ 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.⁴¹ 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 analysis⁴² 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.⁴³ To test for mediation, we used the PROCESS
233 macro for SPSS⁴² 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.⁴⁴

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.⁴⁵ 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.⁴⁵

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 ^a	.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 ^b	.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. ^aRefers to interpersonal communication skills. ^bRefers to problem solving and decision making skills.

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

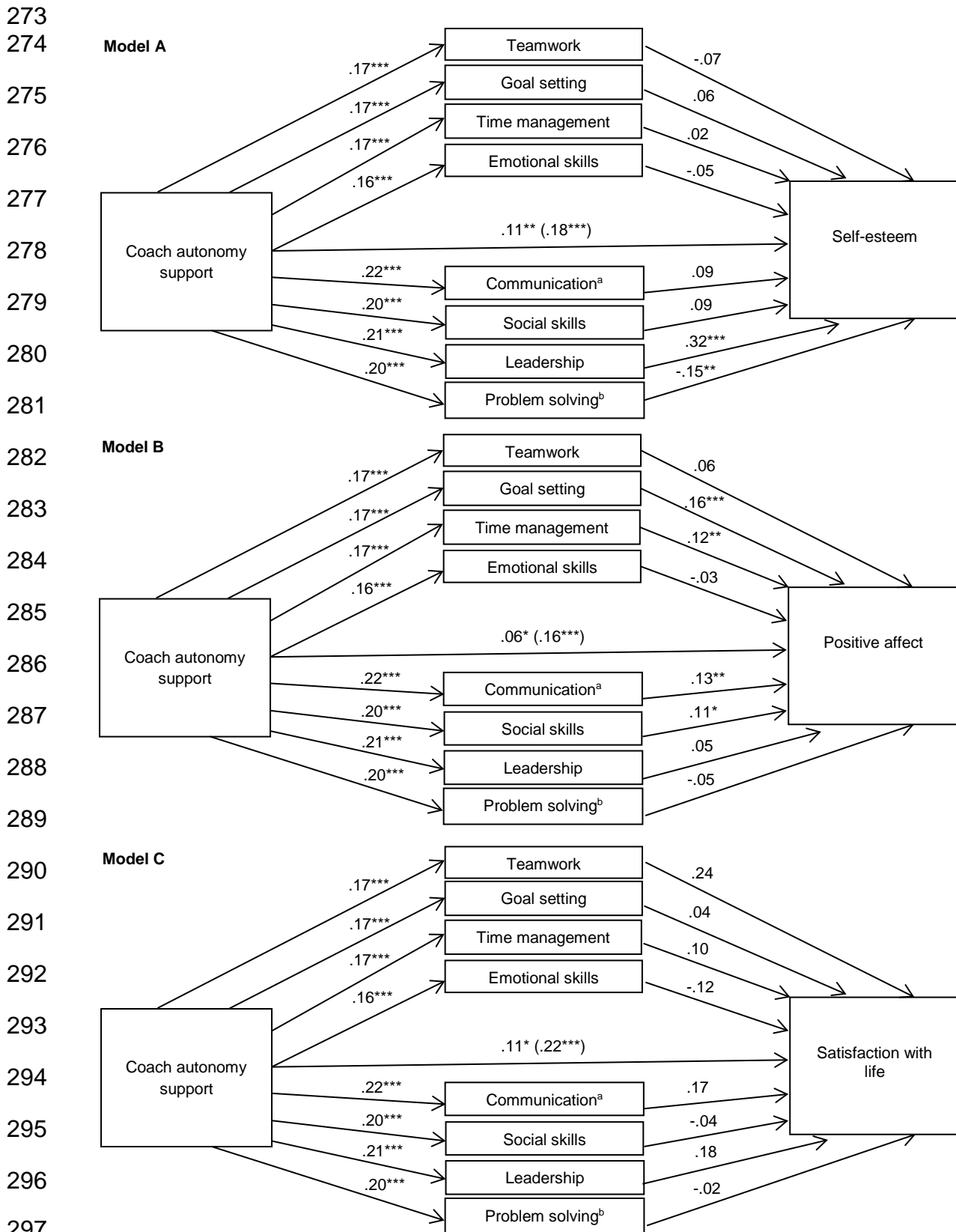


Figure 1. Regression models predicting self-esteem (model A), positive affect (model B), and satisfaction with life (model C). Values signify unstandardized regression coefficients. The direct effect of coach autonomy support on the dependent variable is outside the parentheses. The total effect is inside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

^aRefers to interpersonal communication skills. ^bRefers 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	
Self-esteem						
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 ^a	.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 ^b	-.03	-.03	.01	-2.27	.02	[-.06, -.01]
Model	$F(12, 310) = 5.58^{***}, R^2 = .18$					
Positive affect						
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 ^a	.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 ^b	-.01	-.01	.01	-1.16	.25	[-.03, .01]
Model	$F(12, 310) = 13.45^{***}, R^2 = .34$					
Satisfaction with life						
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 ^a	.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 ^b	-.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.

^aRefers to interpersonal communication skills. ^bRefers 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.

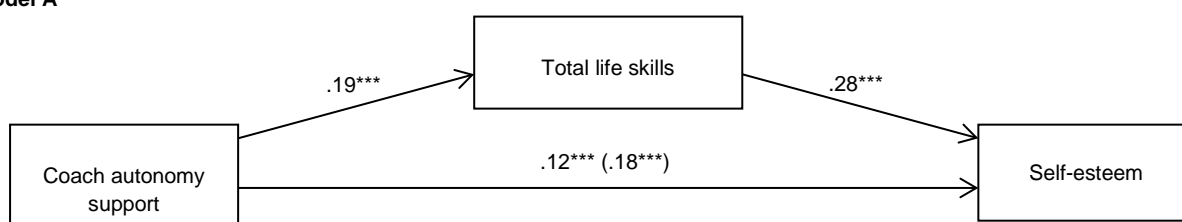
325 The second model included positive affect as the dependent variable (Figure 1, Model
326 B). Within this model, the total effect of coach autonomy support on positive affect was
327 significant. When the mediators were included, the direct effect of coach autonomy support
328 on positive affect was 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,

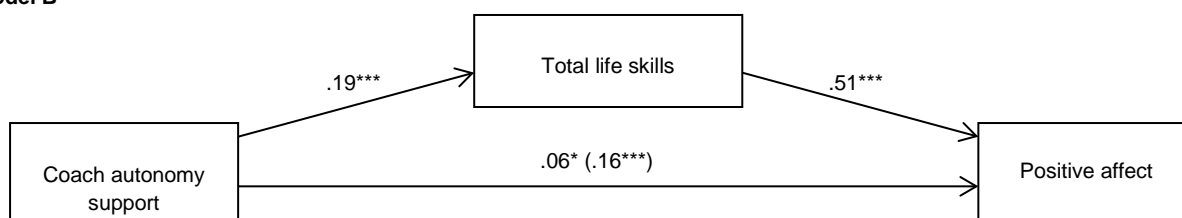
333 Model C). Within this model, the total effect of coach autonomy support on satisfaction with
 334 life was significant. When the mediators were entered into the model, the direct effect of
 335 coach autonomy support on satisfaction with life was reduced but still significant, suggesting
 336 partial 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

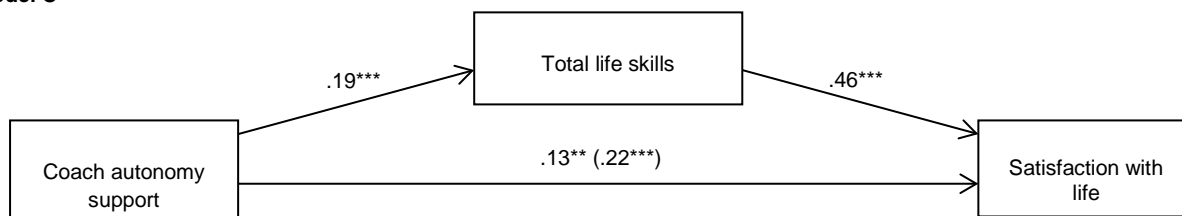
343 **Model A**



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 paper¹⁶, 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,²⁵ 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 LSSS¹⁵ 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 literature⁶ and past difficulties in measuring life skills
381 development within sport.¹⁷ 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)⁴⁶ and sport for development and peace programs (e.g.,
385 Grassroot Soccer)⁴⁷ 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 program⁴⁶, and leadership skills, which is a key outcome of the
389 Grassroot Soccer program.⁴⁷ This would seem a particularly important endeavour given
390 the lack of critical evaluation of such programs.^{48,49}

391 Researchers from both sport³² and developmental psychology² 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,²⁵ 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,^{10,11,24} 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 program⁴⁶ 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.⁵⁰ Other recent studies^{51,52} 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.¹⁰

413 Like Flett et al.’s²⁴ 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.^{21,53} For the interested reader, guidance on how to train coaches to be more
419 autonomy supportive is provided by Su and Reeve's⁵⁴ meta-analysis on autonomy support
420 interventions and Mahoney et al.'s⁵⁵ 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 theory²⁰ 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's¹ 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 Saito¹ 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.⁴³ 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,⁵⁶ along with perceptions of the self in a range of areas combined.⁵⁷ Based on
448 some initial research on life skills transference,⁵⁸ 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's¹ framework – along with recent sports-
458 based models^{17,33} – suggested that life skills development should mediate the relationship
459 between coach autonomy support and participants' psychological well-being. Like
460 previous research,^{12,25,26} 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.²

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.,⁵⁹ 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.⁵⁹ 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.² 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,¹ 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.

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