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The Role of Implicit Beliefs and Achievement Goals as Protective Factors in Youth Sport

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Abstract

2017 © Association for Applied Sport Psychology This study explored whether implicit beliefs and 2×2 achievement goals were related to enjoyment in youth sport over 1 year and whether perceived changes in the coach-athlete relationship moderated these relationships. Indirect and conditional indirect effect analyses were conducted in a sample of 247 regular sport participants (Mage = 13.03 years). After adjusting for enjoyment at Time 1, incremental beliefs were indirectly related to Time 2 enjoyment via mastery-approach goals. However, this effect was evident only when the coach-athlete relationship was perceived to have deteriorated. Results highlight the protective value of adaptive implicit beliefs and achievement goals in youth sport.

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1 **The Role of Implicit Beliefs and Achievement Goals as Protective Factors in Youth**
2 **Sport**

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26

Abstract

27 This study explored whether implicit beliefs and 2x2 achievement goals were related to
28 enjoyment in youth sport over a one-year period, and whether perceived changes in the
29 coach-athlete relationship moderated these relationships. Indirect and conditional indirect
30 effect analyses were conducted in a sample of 247 regular sport participants ($M_{\text{age}}=13.03$
31 years). After adjusting for enjoyment at Time 1, incremental beliefs were indirectly related to
32 Time 2 enjoyment via mastery-approach goals. However, this effect was only evident when
33 the coach-athlete relationship was perceived to have deteriorated. Results highlight the
34 protective value of adaptive implicit beliefs and achievement goals in youth sport.

35 **The Role of Implicit Beliefs and Achievement Goals as Protective Factors in**
36 **Youth Sport**

37 Organized sport is one of the most common types of leisure-time physical activity
38 engaged in by youth worldwide and is particularly prominent within Australia where regular
39 participation rates reach approximately 71-81% annually (Active Healthy Kids Australia,
40 2016; Tremblay et al., 2014). Given these large numbers, youth sport can be considered a
41 valuable medium for improving physical and psychosocial health, as well as promoting
42 positive youth development (Eime, Young, Harvey, Charity, & Payne, 2013; Fraser-Thomas,
43 Côté, & Deakin, 2005). However, after peaking around the ages of 9-11 years, participation
44 rates decline rapidly which can have adverse consequences for adolescent health and
45 development (Australian Sports Commission, 2016; Balish, McLaren, Rainham, &
46 Blanchard, 2014). For example, when compared to youth who regularly participate in sport,
47 individuals who drop out of extra-curricular sport show decreased levels of health-related
48 quality of life and have an increased risk of mental health problems (Vella, Cliff, Magee, &
49 Okely, 2014, 2015). For this reason, research is increasingly focusing on identifying the
50 factors contributing to dropout from organized sport during adolescence. The present research
51 therefore focuses on adolescent sport participants.

52 Recent research investigating achievement motivation within the sport context has
53 offered some support for a link with future sport participation behavior (Gardner, Vella, &
54 Magee, 2017). This research indicates that implicit beliefs and achievement goals underlie
55 youth sport participation. Implicit beliefs, originally proposed by Dweck and Leggett (1988)
56 within the social-cognitive model of achievement motivation (SCMAM), refer to an
57 individuals' conceptions about the nature of their ability in a given context (e.g., sport).
58 Individuals who believe their ability is malleable and can be developed through practice are

59 said to endorse incremental beliefs, whereas individuals who believe their ability is fixed or
60 innate are said to endorse entity beliefs.

61 Within the SCMAM, implicit beliefs are considered to be the antecedents of two
62 achievement goals, known as mastery and performance goals, which in turn influence one's
63 cognitive, affective, and behavioral response patterns (Dweck & Leggett, 1988). Incremental
64 beliefs orient individuals towards mastery goals which are characterized by a focus on
65 learning and self-referenced improvement. Entity beliefs orient individuals towards
66 performance goals which are characterized by a focus on normative displays of competence
67 (Dweck & Elliot, 1983). Research in a variety of achievement contexts has linked
68 incremental beliefs and mastery goals with more adaptive response patterns (e.g., increased
69 motivation, enjoyment, and persistence at challenging tasks), whereas entity beliefs and
70 performance goals have tended to be associated with more maladaptive response patterns
71 (Biddle, Wang, Chatzisarantis, & Spray, 2003; Dweck & Leggett, 1988).

72 More recently, Cury, Elliot, Da Fonseca, and Moller (2006) proposed a revised
73 version of the SCMAM (r-SCMAM) in response to mixed findings that linked performance
74 goals with negative outcomes (e.g., reduced intrinsic motivation) in some studies and positive
75 outcomes (e.g., enhanced intrinsic motivation) in other studies (Elliot, 1997). The r-SCMAM
76 proposes that the initial dichotomous achievement goal framework be replaced with the 2x2
77 achievement goal framework. The 2x2 achievement goal framework builds on the previous
78 mastery-performance goal distinction by incorporating a further approach-avoidance
79 distinction. Approach goals focus on the possibility of achieving or displaying competence,
80 whereas avoidance goals focus on the potential demonstration of incompetence and the need
81 to avoid it (Elliot & McGregor, 2001). Gardner et al. (2017) found some cross-sectional
82 support for the utility of the added 2x2 framework in youth sport participation research, as
83 their results indicated that incremental beliefs were associated with enjoyment and intention

84 to continue indirectly through mastery-approach goals. In contrast, entity beliefs were
85 associated with lower enjoyment indirectly through performance-avoidance goals.

86 Gardner, Vella, and Magee (2016) proposed further revisions to the previous
87 SCMAM and r-SCMAM to specifically explore youth sport participation and dropout.
88 Although similarly highlighting the role of implicit beliefs and achievement goals, this model
89 incorporates the role of key social relationships. The push for the inclusion of key social
90 figures is particularly important in this context given that multiple levels of factors (e.g.,
91 intrapersonal, interpersonal, institutional etc.) have been implicated in youth sport
92 participation and dropout (Balish et al., 2014; Crane & Temple, 2015). It is proposed that
93 perceptions of relationships with key social figures (e.g., coaches, parents, and peers) could
94 moderate the effects of implicit beliefs and achievement goals on outcomes (Gardner, Vella,
95 et al., 2016). Consideration of social figures is also consistent with calls in the implicit belief
96 literature for potential moderators to be examined (Vella, Braithewaite, Gardner, & Spray,
97 2016). Although both implicit beliefs/achievement goals and key social factors have been
98 independently associated with indicators of sport participation and dropout behavior, research
99 has not yet examined the potential interactive effects in this way (Gardner, Magee, & Vella,
100 2016; Gardner et al., 2017).

101 Coaches could be a particularly important social figure to consider in the context of
102 youth sport. Positive coach-athlete relationships have consistently been linked with adaptive
103 outcomes in sport, including sustained participation (Gardner, Magee, et al., 2016; Gould,
104 Collins, Lauer, & Chung, 2007; Rottensteiner, Konttinen, & Laakso, 2015). According to
105 Jowett's (2007) 3+1Cs model, high quality coach-athlete relationships are based on closeness
106 (e.g., feelings of trust and mutual respect), complementarity (e.g., responsiveness and
107 cooperation), commitment (e.g., planning to maintain a strong relationship), and co-
108 orientation (e.g., shared views and mutual understanding). Although parents and peers also

109 play an important role in youth sport participation, research suggests that coaches may be
110 more strongly linked to enjoyment and may even compensate for other less supportive
111 relationships (Gardner, Magee, et al., 2016; Scanlan, Carpenter, Lobel, & Simons, 1993).
112 Moreover, there is experimental evidence that changes in coach behaviors can affect athlete
113 outcomes such as self-esteem, enjoyment, and dropout (Eime et al., 2013; Langan, Blake, &
114 Lonsdale, 2013). Although it has not yet been investigated, it is plausible that changes in the
115 coach-athlete relationship over time moderate the relationship between implicit beliefs and
116 outcomes.

117 The present research aims to explore the relationships among implicit beliefs,
118 achievement goals, and perceived changes in the coach-athlete relationship over a one-year
119 period. In line with previous research (e.g., Gardner et al., 2017), enjoyment will be used as
120 an indicator of future sport participation behavior given its identification as the most
121 commonly reported reason for continued participation or dropout (Crane & Temple, 2015).
122 Consistent with previous cross-sectional findings, it is hypothesized that incremental beliefs
123 and mastery-approach goals will lead to greater enjoyment after one-year, whereas entity
124 beliefs and performance-avoidance goals will lead to lower enjoyment after one-year.
125 Although previously unexplored, it is expected that changes in the coach-athlete relationship
126 will predict enjoyment over the one-year period and moderate the relationships between
127 implicit beliefs, achievement goals, and enjoyment. Specifically, improvements in the coach-
128 athlete relationship are hypothesized to buffer the negative influence of maladaptive implicit
129 beliefs and achievement goals (entity beliefs and performance-avoidance goals) on
130 enjoyment. In contrast, a coach-athlete relationship that has deteriorated may weaken the
131 positive effects of adaptive implicit beliefs and achievement goals (incremental beliefs and
132 mastery-approach goals) on enjoyment. Given the varying role of perceived competence
133 within both the SCMAM and the r-SCMAM, and consistent with previous research,

134 perceived competence will be included as a covariate in all analyses (Gardner et al., 2017).
135 Other potentially confounding factors that will be included as covariates include: age, sex,
136 and perceptions of parental and peer relationships (Balish et al., 2014; Gardner, Vella, et al.,
137 2016; Vella, Cliff, & Okely, 2014).

138 **Method**

139 **Participants and Procedures**

140 Participants in this study were recruited from two private high schools in Sydney,
141 Australia. A total of 393 students (94 males, 299 females) were initially recruited and
142 completed a written questionnaire during their regular Physical Education lesson at school.
143 Of the 393 students, 327 students (77 males, 250 females; $M_{age} = 13.03$, $SD = .84$) reported
144 regular participation in organized extracurricular sport and provided responses to a battery of
145 questionnaires with respect to the sport they considered to be their main sport. These students
146 were invited to participate in a follow-up questionnaire 12 months later, with data collected
147 from 273 sport participants (83.5% study retention rate) aged between 11 and 15 years (62
148 males, 211 females; $M_{age} = 13.01$, $SD = .83$) at baseline. Two hundred and forty-seven
149 participants (90%; 54 males, 193 females) reported continued participation in their main
150 sport, whereas 26 (10%; 8 males, 18 females) reported that they had dropped out of their
151 main sport. Only participants who reported continued participation in their main sport, and
152 thus completed all measures regarding the same sport at both time points, were included in
153 the study. Approval for the study was gained via the institutional research ethics committee.

154 **Measures**

155 **Implicit Beliefs.** The Conceptions of the Nature of Athletic Ability Questionnaire-
156 Version 2 (CNAAQ-2; Biddle et al., 2003) was used to measure implicit incremental and
157 entity beliefs about athletic ability. The instrument includes 12 items, which are scored in
158 relation to four subscales. Incremental beliefs were assessed through the Learning subscale

159 (e.g., “You need to learn and to work hard to be good at sport”) and the Improvement
160 subscale (e.g., “How good you are at sport will always improve if you work at it”). Entity
161 beliefs were assessed through the Stable subscale (e.g., “Even if you try, the level you reach
162 in sport will change very little”) and the Gift subscale (e.g., “To be good at sport you need to
163 be naturally gifted”). Responses were given on a 5-point scale ranging from 1 (*strongly*
164 *disagree*) to 5 (*strongly agree*). This questionnaire has been found to have adequate reliability
165 and validity in youth populations (Biddle et al., 2003). In the current study, the Cronbach’s
166 alpha for the subscales ranged from .66 - .70.

167 **Achievement Goals.** Achievement goals were assessed using the Achievement Goals
168 Questionnaire for Sport (AGQ-S; Conroy, Elliot, & Hofer, 2003). The instrument consists of
169 12 items assessing mastery-approach goals (e.g., “It is important to me to perform as well as I
170 possibly can”), mastery-avoidance goals (e.g., “Sometimes I’m afraid that I may not perform
171 as well as I’d like”), performance-approach goals (e.g., “My goal is to do better than most
172 other performers”), and performance avoidance goals (e.g., “I just want to avoid performing
173 worse than others”). Responses were given on a 7-point scale ranging from 1 (*not at all like*
174 *me*) to 7 (*completely like me*). The psychometric properties have been supported in youth
175 sport populations (Conroy et al., 2003). Cronbach’s alpha for the four subscales ranged from
176 .70 - .84.

177 **Coach-Athlete Relationship Quality.** Perceived quality of the coach-athlete
178 relationship was assessed using the Coach-Athlete Relationship Questionnaire (CART-Q;
179 Jowett & Ntoumanis, 2004). The questionnaire consists of 11 items that are scored in relation
180 to three subscales: Closeness (e.g., “I like my coach”), Commitment (e.g., “I feel committed
181 to my coach”), and Complementarity (e.g., “When I am coached by my coach, I am ready to
182 do my best”). Each item includes a seven-point scale ranging from 1 (*strongly disagree*) to 7
183 (*strongly agree*). The subscales were summed to produce an overall coach-athlete

184 relationship score. The scales validity and reliability has been demonstrated in the youth sport
185 context (Jowett & Ntoumanis, 2004). Cronbach's alpha in the current study was $\alpha = .93$ at
186 Time 1 and $\alpha = .96$ at Time 2.

187 **Enjoyment.** Enjoyment in sport was measured using the Enjoyment subscale from the
188 Sport Commitment Model (SCM; Scanlan, Simons, Carpenter, Schmidt, & Keeler, 1993).
189 The scale includes four items (e.g., "Do you have fun playing your main sport?") rated on a
190 five-point scale ranging from 1 (*not at all*) to 5 (*very much*). Cronbach's alpha in the current
191 study was $\alpha = .95$ at both Time 1 and Time 2.

192 **Covariates.** Variables controlled for in the analyses included participants' age, sex,
193 perceptions of competence, and perceptions of parental support, friendship quality, and peer
194 acceptance as identified in Gardner and colleagues' (2016) proposed motivational model.
195 Perceived competence was assessed using the Athletic Competence subscale of Harter's
196 (1985) Self-Perception Profile for Children ($\alpha = .76$); parental support was assessed using
197 Van Yperen's (1995) Perceived Parental Support Scale ($\alpha = .77$); friendship quality in sport
198 was assessed using Weiss and Smith's (1999) Sport Friendship Quality Scale ($\alpha = .90$); and
199 peer acceptance was assessed using the Social subscale from Harter's (1985) Self-Perception
200 Profile for Children ($\alpha = .83$).

201 **Statistical Analysis**

202 To assess change in the perceived quality of the coach-athlete relationship over the
203 one year period, a raw change score was computed by deducting scores at Time 1 from scores
204 at Time 2. Descriptive statistics and bivariate Pearson's correlations were calculated for each
205 of the variables of interest. Linear regression was conducted to explore the link between
206 change in perceived coach-athlete relationship quality and enjoyment at Time 2 after
207 adjusting for enjoyment at Time 1.

208 The potential indirect effects of implicit beliefs (independent variables) on Time 2
209 enjoyment (dependent variable) through achievement goals (mediating variables), while
210 controlling for enjoyment at Time 1, were tested using two separate models. First, the indirect
211 path linking incremental beliefs at Time 1 on Time 2 enjoyment via the two mastery goals
212 was tested controlling for Time 1 enjoyment, entity beliefs, performance-approach goals,
213 performance-avoidance goals, age, sex, perceived competence, parental support, friendship
214 quality, and peer acceptance. Second, the indirect path linking entity beliefs at Time 1 with
215 Time 2 enjoyment via the two performance goals was tested controlling for Time 1
216 enjoyment, incremental beliefs, mastery-approach goals, mastery-avoidance goals, perceived
217 competence, parental support, friendship quality, and peer acceptance. Both models used a
218 bootstrapping procedure with 5000 resamples to determine the significance of the indirect
219 effects on the basis of 95% confidence intervals.

220 Conditional indirect effects were then examined to investigate whether the indirect
221 paths linking Time 1 beliefs to Time 2 enjoyment via goals were moderated by changes in the
222 coach-athlete relationship. Using the approach recommended by Hayes (2013), four
223 conditional indirect path models were tested: incremental beliefs to change in enjoyment via
224 mastery-approach goals; incremental beliefs to change in enjoyment via mastery-avoidance
225 goals; entity beliefs to change in enjoyment via performance-approach goals; entity beliefs to
226 change in enjoyment via performance-avoidance goals. Time 1 enjoyment, age, sex,
227 perceived competence, parental support, friendship quality, peer acceptance, as well as the
228 remaining implicit belief and achievement goals were controlled for in each of the models. A
229 bootstrapping procedure with 5000 resamples was used to determine the significance of the
230 conditional indirect effects on the basis of 95% confidence intervals at 3 levels of the
231 moderator (1 standard deviation below the mean, the mean, and 1 standard deviation above

232 the mean). All analyses were conducted using Mplus version 7 (Muthén & Muthén, 1998-
233 2012).

234 **Results**

235 **Descriptive Statistics**

236 Descriptive statistics are illustrated in Table 1. Incremental beliefs and mastery-
237 approach goals were positively correlated with enjoyment at both time points, whereas entity
238 beliefs and performance-avoidance goals were negatively correlated with enjoyment at both
239 time points. On average, the sample reported a slight negative change in their perceptions of
240 the coach-athlete relationship over the one-year period. The descriptive statistics are
241 summarized in Table 1. Initial regression analyses indicated that changes in the perceived
242 coach-athlete relationship predicted enjoyment at Time 2, $B = .10$, $p < .001$, after controlling
243 for enjoyment at Time 1, age, sex, incremental beliefs, entity beliefs, mastery-approach goals,
244 mastery-avoidance goals, performance-approach goals, performance-avoidance goals,
245 perceived competence, parental support, friendship quality, and peer acceptance.

246 **Indirect Effects Analyses**

247 **Incremental beliefs and mastery goals.** The indirect models indicated that
248 incremental beliefs were positively associated with mastery-approach goals, ($B = .15$, $p <$
249 $.001$), and mastery-avoidance goals, ($B = .14$, $p = .01$) after controlling for the covariates
250 listed above. However, neither mastery-approach goals, ($B = .27$, $p = .07$), nor mastery-
251 avoidance goals, ($B = .01$, $p = .89$), were significantly related to Time 2 enjoyment. The
252 direct effect of incremental beliefs on enjoyment was not significant, ($B = -.02$, $p = .81$).
253 Incremental beliefs were indirectly associated with Time 2 enjoyment through mastery-
254 approach goals; however, the indirect path linking incremental beliefs with enjoyment
255 through mastery-avoidance goals was not significant. The indirect effects are summarized in
256 Table 2.

257 **Entity beliefs and performance goals.** Entity beliefs were positively associated with
258 performance-approach goals, ($B = .20, p < .001$), and performance-avoidance goals, ($B = .19,$
259 $p < .001$) after controlling for the covariates listed above. However, neither performance-
260 approach goals, ($B = .05, p = .50$), nor performance-avoidance goals, ($B = -.09, p = .15$), were
261 significantly related to Time 2 enjoyment. The direct effect of entity beliefs on enjoyment
262 was not significant, ($B = -.14, p = .72$). The indirect paths linking entity beliefs with Time 2
263 enjoyment through performance-approach and performance-avoidance goals were not
264 significant. The indirect effects are summarized in Table 2.

265 **Conditional Indirect Effects Analyses**

266 Table 3 provides a summary of the conditional indirect effect results at low (one
267 standard deviation below the mean; -15), average (the mean; -2.07), and high (one standard
268 deviation above the mean; 10.86) levels of the moderator for each model. After adjusting for
269 enjoyment at Time 1, significant conditional indirect effects emerged in the model linking
270 incremental beliefs with Time 2 enjoyment through mastery-approach goals. Changes in
271 perceptions of the coach-athlete relationship significantly moderated the indirect effects at
272 both one standard deviation below the mean and the mean. There was no significant
273 conditional indirect effect at one standard deviation above the mean. Therefore, the indirect
274 effect of mastery-approach goals in the relationship between incremental beliefs and
275 enjoyment became stronger as the coach-athlete relationship deteriorated. There were no
276 significant conditional indirect effects for any of the remaining models.

277 **Discussion**

278 This study examined whether implicit beliefs and achievement goals were related to
279 enjoyment in youth sport over a one-year period, and whether changes in the perceived
280 coach-athlete relationship moderated these relationships. In partial support of our hypotheses,
281 incremental beliefs were indirectly related to greater enjoyment through mastery-approach

282 goals. This suggests that the belief that ability can be increased and developed through
283 practice, may be related to greater enjoyment due to a focus on demonstrating self-referenced
284 mastery of skills. Perceived change in the quality of the coach athlete relationship predicted
285 enjoyment at one-year follow up. However, the indirect effect of incremental beliefs on
286 enjoyment through mastery-approach goals was only evident when the coach-athlete
287 relationship was perceived to have deteriorated. This novel finding may reflect the protective
288 value of adaptive implicit beliefs and achievement goals in the youth sport context. No other
289 indirect or conditional indirect effects were found.

290 The finding that incremental beliefs were linked with greater enjoyment via mastery-
291 approach goals is consistent with theoretical expectations and previous cross-sectional youth
292 sport research (Cury et al., 2006; Gardner et al., 2017). However, contrary to expectations,
293 there was no indirect effect of performance-avoidance goals in the relationship between entity
294 beliefs and enjoyment. Given that entity beliefs were expected to be associated with a
295 reduction in enjoyment, this may be due to the sample reporting high levels of enjoyment at
296 both time points. It may also reflect a common issue in youth sport research where the
297 associations between entity beliefs and outcomes are weaker relative to incremental beliefs
298 (Vella et al., 2016). This may be because the effects of implicit beliefs are more prominent
299 during times of adversity which may not be as common within voluntary sport, as compared
300 to other non-voluntary contexts, such as school (Dweck, 1999).

301 There were also no indirect effects present through mastery-avoidance or
302 performance-approach goals. Although this is consistent with previous research identifying
303 the strongest links between incremental beliefs/mastery-approach goals and entity
304 beliefs/performance-avoidance goals (Gardner et al., 2017; Stenling, Hassmén, &
305 Holmström, 2014; Stevenson & Lochbaum, 2008), the findings raise questions regarding
306 whether the inclusion of all four achievement goals is necessary. Rather, the findings may be

307 lending more support to a dichotomous framework, similar to Dweck and Leggett's (1988)
308 original proposal. More research is needed on the 2x2 achievement goal framework to better
309 understand the role and significance of mastery-avoidance and performance-approach goals
310 in the youth sport context.

311 The link between change in perceptions of the coach-athlete relationship and
312 enjoyment over the one-year period is in line with previous research highlighting the
313 importance of the coach for enjoyment and continued participation in youth sport (Gardner,
314 Magee, et al., 2016; Gould et al., 2007; Rottensteiner et al., 2015). The finding that the
315 indirect relationship between implicit beliefs and enjoyment via mastery-approach goals was
316 only significant when the perceived coach-athlete relationship deteriorated demonstrates the
317 value of endorsing incremental beliefs and mastery-approach goals. Given most studies
318 exploring the SCMAM are cross-sectional in nature, this finding adds to our current
319 understanding of implicit beliefs and achievement goals, and provides new information about
320 the interactive effect of the social environment over time. The finding suggests that, even
321 when this key relationship is declining, individuals can fall back on their adaptive implicit
322 beliefs and achievement goals to sustain their enjoyment and participation. Research
323 investigating implicit beliefs in the personality domain found that during times of social
324 adversity, adolescents endorsing incremental beliefs had less negative reactions (e.g., shame,
325 aggression, stress) than those endorsing entity beliefs (Yeager et al., 2014). Although this
326 research was conducted in the school setting with a focus on peer relationships, it is feasible
327 that implicit beliefs set up an interpretive framework that guides responses in a range of
328 areas, including sport. It may not be until the individuals are experiencing difficulties with
329 their social relationships that we are able to see the protective value of their adaptive implicit
330 beliefs and achievement goals.

331 However, given there were no indirect or conditional indirect effects evident for any
332 of the other models, we cannot overstate these findings and must acknowledge the numerous
333 other variables that can influence levels of youth sport enjoyment and participation over time.
334 For example, some of these may include conflict between other sport or non-sport activities,
335 over-training and burnout, injuries, time and financial costs, parental pressure or over-
336 involvement, an overemphasis on winning, and difficulty accessing facilities (Balish et al.,
337 2014; Crane & Temple, 2015).

338 **Theoretical and Practical Implications**

339 The present research aimed to explore the links between implicit beliefs, achievement
340 goals, and outcomes based on Dweck and Leggett's (1988) original SCMAM, Cury et al.'s
341 (2006) r-SCMAM, and Gardner, Vella et al.'s (2016) subsequent adaptation for
342 understanding youth sport participation and enjoyment. The findings provide support for the
343 notion that adaptive implicit beliefs and achievement goals lead to positive outcomes;
344 however, there was less support for the role of entity beliefs and performance goals. Findings
345 provide some support for the inclusion of the approach-avoidance distinction, although as
346 previously mentioned, this remains a contentious issue given the continued uncertainty
347 surrounding the role of mastery-avoidance and performance-approach goals. Additionally,
348 given perceived competence was only included as a covariate, its role within the model
349 requires further exploration. For example, future research should investigate whether
350 perceived competence plays a moderating role between achievement goals and outcomes (as
351 proposed in the original SCMAM) or is an independent antecedent on achievement goals (as
352 proposed in the r-SCMAM).

353 Although the proposed addition of key social figures as moderating factors was
354 partially supported, the nature of these effects was not strong or in the hypothesized direction.
355 Despite this, it is clear that the coach plays a significant role in youth sport enjoyment and

356 participation and should be considered in addition to the cognitive factors in the model.
357 Future research should also explore the role of other key social relationships, including those
358 with parents and peers. One such avenue of investigation may include exploring the role of
359 social goals within the model. Similar to achievement goals which view competence as the
360 primary motive of behavior, social goals view the desire for social connections as the central
361 motive of behavior in sport (Allen, 2003). Allen (2005) identified three types of social goals
362 individuals might pursue in sport: affiliation goals (focus on developing reciprocal
363 relationships), recognition goals (focus on gaining recognition from others for effort or
364 ability), and status goals (focus on gaining popularity). Social affiliation goals are considered
365 intrinsic and have been linked with more adaptive outcomes including greater interest and
366 enjoyment in sport (Allen, 2003). In contrast, recognition and status goals rely on extrinsic
367 validation and may produce maladaptive outcomes if validation is not received (Hodge,
368 Allen, & Smellie, 2008). Understanding the type of social goals individuals are pursuing may
369 therefore help to further explain individuals' response patterns, particularly during times of
370 social adversity.

371 In a practical sense, the findings highlight the protective value of incremental beliefs
372 and mastery-approach goals and the need to facilitate them among youth sport participants.
373 Researchers should target younger age groups so they are equipped to interpret and respond
374 adaptively as they progress through the adolescent years which are often associated with
375 social difficulties and stress (Fraser-Thomas et al., 2005). Previous research has demonstrated
376 the successful adjustment of adolescent's implicit beliefs about athletic ability (Spray, Wang,
377 Biddle, Chatzisarantis, & Warburton, 2006), however it is unknown how long these
378 manipulation effects can last. Given the primary role of the coach and their frequent
379 interaction with sport participants, it is feasible that regularly promoting incremental beliefs
380 and mastery-approach goals could have lasting effects. Vella, Cliff, Okely, Weintraub, and

381 Robinson (2014) identified six instructional strategies coaches can use to promote
382 incremental beliefs. These include focusing on effort and persistence (e.g., through rewards
383 and feedback), providing challenge (e.g., through moderately difficult tasks or goal setting),
384 exploring the value of setbacks (e.g., by facilitating reflection and problem solving),
385 promoting self-referenced learning and a mastery climate (e.g., avoiding normative
386 comparisons), providing high performance expectations (e.g., encouraging athletes to
387 improve) and emphasizing the definition of success as giving best efforts. Coach education
388 programs could aid coaches in understanding the need to facilitate adaptive implicit beliefs
389 and achievement goals and provide information on how to implement these strategies.

390 Parents could also influence the types of implicit beliefs and achievement goals
391 adolescents adopt, particularly given the greater amount of time they spend with the youth
392 sport participant. It is argued that the way that parents respond to their child's achievement
393 related behavior (e.g., through praise or criticism) can shape their achievement motivation in
394 a range of contexts (Dweck, 1999). To encourage appropriate and supportive parenting in
395 sport, rules and campaigns such as "Silent Saturdays" and "Play by the Rules" have been
396 introduced (Active Healthy Kids Australia, 2016). However, parents need to be informed
397 about the implications of their behaviors at all times, including those away from the sporting
398 field (Elliott & Drummond, 2017). Parent education programs could teach parents the value
399 of adaptive implicit beliefs and achievement goals for their child's development and provide
400 them with strategies to promote them. For example, post-game debriefs should include
401 recognition of improvements based on their previous skill level, avoiding comparing their
402 performance to others', and encouraging practice for further improvements. Furthermore,
403 parents need to be aware of the way they convey their own achievement motivation to their
404 children, as research has linked youth sports participants' perceptions of their parents'
405 achievement orientations with the development of their own achievement orientations

406 (Weigand, Carr, Petherick, & Taylor, 2001). This is particularly important during late
407 childhood when children begin to differentiate between effort and ability, and are therefore
408 susceptible to developing a maladaptive achievement orientation (Nicholls, 1984).

409 **Strengths and Limitations**

410 Limitations of the study include the low number of individuals who dropped out of
411 sport which led to the use of enjoyment as a proxy measure of dropout. Although enjoyment
412 is considered the most common reason for continued participation and dropout (Crane &
413 Temple, 2015), the results may have been skewed by only including regular sport
414 participants. As is common in youth sport research, participants tended to report very high
415 levels of enjoyment, incremental beliefs, and mastery-approach goals which may produce
416 ceiling effects (Stenling et al., 2014). The low rate of dropout in the sample may be due to
417 recruiting participants from private high schools. These students are generally from higher
418 socioeconomic positions which is an established predictor of sport participation (Vella, Cliff,
419 & Okely, 2014). Future studies should recruit larger sample sizes from a range of
420 socioeconomic positions to enable the investigation of individuals who have dropped out of
421 sport. Given the effects of implicit beliefs are expected to be most apparent during times of
422 adversity, this may allow us to better explore the role of entity beliefs/performance goals in
423 conjunction with social relationships.

424 Other limitations include the failure to measure the length of the coach-athlete
425 relationship and track whether the coaches remained the same from Time 1 to Time 2. This
426 may be particularly important as there tends to be a high rate of turnover of youth sport
427 coaches (O'Connor & Bennie, 2006). Future studies should therefore measure and control for
428 these factors. The research also focused on sport participants within a narrow age range
429 where dropout is already an established issue. Research may benefit from focusing on
430 younger participants with the aim of preventing dropout before it occurs. Finally, there were a

431 large number of females as compared to males in the sample. Future research should aim to
432 use larger samples consisting of more even numbers of males and females. This would lead to
433 more generalizable findings and would allow researchers to explore whether the relationships
434 among implicit beliefs, achievement goals, and key social figures vary based on sex.

435 Strengths of the research include the use of a prospective design which allowed us to
436 explore perceptions of the coach-athlete relationship and enjoyment over time. The study
437 addressed a need for research to further explore potential moderating variables in the
438 relationship between implicit beliefs and outcomes (Gardner, Vella, et al., 2016; Vella et al.,
439 2016), and was the first to consider the coach in this way. The inclusion of other key social
440 variables (parental and peer relationships) as covariates in all analyses also strengthened the
441 research.

442 **Conclusion**

443 This study revealed that the belief that ability is malleable and can be improved
444 through practice (i.e., incremental beliefs) is related to greater levels of enjoyment, in part
445 due to a focus on achieving self-referenced mastery (i.e., mastery-approach goals). Perceived
446 change in the quality of the coach-athlete relationship was also related to enjoyment over the
447 one-year period. When individuals perceived deterioration in the quality of the coach-athlete
448 relationship, the indirect effect of mastery-approach goals on the relationship between
449 incremental beliefs and enjoyment was stronger. This highlights the protective value of
450 adaptive implicit beliefs and achievement goals in youth sport. These findings could have
451 important implications for sport participants during times of social adversity. Researchers and
452 sports organizations should aim to educate coaches and parents on the significance of
453 incremental beliefs and mastery-approach goals for positive development and provide them
454 with strategies to facilitate these adaptive implicit beliefs and achievement goals in youth
455 sports participants.

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