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Instructional strategies to promote incremental beliefs in youth sport

Stewart A. Vella

University of Wollongong, stvella@uow.edu.au

Dylan P. Cliff

University of Wollongong, dylanc@uow.edu.au

Anthony D. Okely

University of Wollongong, tokely@uow.edu.au

Dana L. Weintraub

Stanford University

Thomas N. Robinson

Stanford University, tom.robinson@stanford.edu

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Abstract

Implicit beliefs about the nature of human abilities have significant motivational, behavioral, and affective consequences. The purpose of this article was to review the application of implicit beliefs to the youth sport context and to provide theoretically derived and evidence-based instructional strategies to promote adaptive implicit beliefs about human abilities within this context. A narrative overview of theory and a review of research pertaining to implicit beliefs in education, sport, and physical activity are undertaken. Theoretically derived and evidence-based instructional strategies are outlined, and specific coaching behaviors are suggested. Six instructional strategies to promote adaptive implicit beliefs in these contexts are suggested: focusing on effort and persistence, facilitating challenge, promoting the value of failure, defining success as effort, the promotion of learning, and providing high expectations. It is concluded that instructional strategies may be used to facilitate positive motivational, behavioral, and affective outcomes for young people within a sport context.

Keywords

beliefs, strategies, incremental, instructional, promote, sport, youth

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Suggested Running Head: PROMOTING INCREMENTAL BELIEFS

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18 based instructional strategies to promote adaptive implicit beliefs about human abilities
19 within this context. A narrative overview of theory and review of research pertaining to
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Key words: Implicit theory, entity theory, self-theories, coaching, pedagogy

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Instructional Strategies to Promote Incremental Beliefs in Youth Sport

Fundamental implicit beliefs about the nature of human abilities as either a fixed or malleable trait have significant short- and long-term implications for individuals' motivational frameworks, including their beliefs, affect, attributions, and behaviors (Dweck, 1999, 2006; Dweck & Leggett, 1988). This is true in child and adolescent sports contexts where research has shown that beliefs about the nature of athletic ability predict motivation, enjoyment, interest, persistence, goal orientation, self-efficacy, positive affect, motor development, and skill acquisition (Biddle, Wang, Chatzisarantis, & Spray, 2003; Jourden, Bandura, & Banfield, 1991; Kasimatis, Miller, & Marcussen, 1996; Van-Yperen & Duda, 1999). Given the significant psychosocial and health benefits associated with participation in organized sports in childhood and adolescence (Fraser-Thomas, Côté, & Deakin, 2005), coupled with high rates of drop-out from youth sports among children and adolescents (Hedstrom & Gould, 2004), implicit beliefs about ability are an important avenue of research within these contexts. The implications and applications of such research would be relevant to fields including sports psychology, coaching, physical education, and public health.

Implicit beliefs are acquired beliefs about the nature of human abilities (Gunderson et al., 2013). These beliefs exert a strong influence on human behavior because they provide an underlying framework for the interpretation and response to events within an achievement context (Dweck & Leggett, 1988). There are two basic types of implicit beliefs: incremental beliefs, and entity beliefs. Those who hold an incremental belief operate under the assumption that ability is a malleable, fluid, and changeable quality that can be developed (herein referred to as incremental beliefs). In contrast, those who hold an entity belief operate under the assumption that ability is a fixed, concrete, and internal entity (herein referred to as entity beliefs). Research consistently shows that incremental beliefs are associated with more

55 adaptive responses including higher rates of motivation, persistence, and effort, a greater
56 preference for challenge, and an ability to generate strategies for improvement (Blackwell,
57 Trzesniewski, & Dweck, 2007; Dweck & Leggett, 1988; Gunderson et al., 2013).
58 Furthermore, implicit beliefs are particularly powerful predictors of adaptive responses
59 following failure or setback (Dweck & Leggett, 1988). Those who hold incremental beliefs of
60 athletic ability are concerned with mastering new skills. As such, failure is not seen as a
61 setback, but is seen as an opportunity to learn. **Failure** also provides an indication that greater
62 effort is required. Alternatively, those who hold entity beliefs of athletic ability feel the need
63 to validate their ability through athletic successes. Challenges represent greater potential risks
64 to their **perceptions of** competence, and response to failures are significantly more negative
65 because failure is indicative of inadequacy (Dweck, 1999). **Furthermore, it is important to**
66 **note that implicit beliefs about ability exert a strong influence on behavior regardless of the**
67 **true nature of ability as either fixed or malleable. Ability has been defined as an inherited and**
68 **relatively stable trait that is not easily modifiable with practice (Schmidt & Lee, 2011). On**
69 **the other hand, skills are seen as modifiable with practice, but only within the limits of one's**
70 **ability (Schmidt & Lee, 2011). However, consistent with a large body of previous work**
71 **pertaining to implicit beliefs, and consistent with a lay definition, we make no differentiation**
72 **between ability and skill.**

73 Given the significant repercussions that implicit beliefs have on participation in
74 organized sports and physical activity, and their associated psychological benefits, it is
75 important to understand how these beliefs develop. Individual differences in implicit beliefs
76 of various human attributes begin to emerge in the preschool years (Giles & Heyman, 2003;
77 Smiley & Dweck, 1994). However, it is likely that implicit beliefs have their genesis in social
78 and environmental antecedents that are encountered even earlier than this (Gunderson et al.,
79 2013). In the sports context, a primary social influence responsible for the development of

80 incremental beliefs is the coach (Slater, Spray, & Smith, 2012). However, it is currently
81 unclear exactly how this process occurs. Experimental procedures successfully used to
82 temporarily manipulate implicit beliefs regarding athletic ability demonstrate that it is
83 possible to induce incremental beliefs through instruction (Spray, Wang, Biddle,
84 Chatzisarantis, & Warburton, 2006). This is consistent with a large body of literature
85 demonstrating the primary social influence of the coach on the behaviors and cognitions of
86 young people, especially within the sporting context (Côté, Bruner, Erickson, Strachan, &
87 Fraser-Thomas, 2010). However, an individual's underlying implicit beliefs do not
88 necessarily translate into corresponding communication patterns. It has been shown that
89 parents who hold incremental beliefs are more likely to communicate to their children in
90 ways that facilitate entity beliefs than incremental ones (Gunderson et al., 2013). This may be
91 because adults find it difficult to turn their own incremental beliefs into communication
92 patterns that are consistent with that belief. Alternatively, it may be that the desire to increase
93 children's self-esteem by focussing on their ability (and thus reinforcing entity beliefs) works
94 against parents who wish to communicate more adaptive incremental beliefs. Therefore, the
95 purpose of this paper is to briefly review critical findings on implicit beliefs, and to provide
96 instructional strategies that can be used to promote incremental beliefs regarding athletic
97 ability within youth sport contexts.

98 **Implicit Belief Research**

99 Diener and Dweck (1978) provided some early evidence for the mechanisms by
100 which incremental beliefs may lead to more adaptive outcomes by showing that children who
101 focussed on mastery engaged in higher rates of solution-directed behaviors such as self-
102 monitoring in order to produce future successes following failure. In contrast, these
103 experiments indicate that children who attribute failure to a lack of ability experienced
104 disproportionate decrements to their perceived ability, resulting in a more negative view of

105 the future. In order to explain these results, and to explain why some children adopt a mastery
106 goal orientation and others adopt a performance goal orientation, Dweck hypothesized a
107 higher level cognitive pattern constituted by implicit beliefs about the nature of human ability
108 (Dweck, 1999). According to the resultant socio-cognitive theory of achievement motivation
109 (Dweck & Leggett, 1988), children who believe that ability is a malleable quality
110 (incremental beliefs) are more likely to adopt a mastery goal orientation. On the other hand,
111 children who believe that ability is a fixed trait (entity beliefs) are more likely to become
112 focussed on performance. Research generated by this model has since confirmed that the
113 adoption of incremental beliefs regarding one's intelligence predicts higher rates of academic
114 achievement across childhood, adolescence, and beyond (Aronson, Fried, & Good, 2002;
115 Blackwell et al., 2007; Good, Aronson, & Inzlicht, 2003). Consistent with this early work, a
116 recent meta-analysis shows that incremental beliefs predict goal setting, goal operating, and
117 goal monitoring, which in turn predict goal achievement. More specifically, the relationship
118 between implicit beliefs and goal achievement is partially mediated by the adoption of
119 learning goals, mastery-based strategies, and high expectations, as well as the avoidance of
120 negative emotions and "helpless" responding (Burnette, O'Boyle, VanEpps, Pollack, &
121 Finkel, 2013). Longitudinal research indicates that the result of self-regulatory strategies that
122 are derived from incremental beliefs is an upward trajectory in performance, while entity
123 beliefs result in a flat trajectory over time (Blackwell et al., 2007). Interventions have shown
124 that the adoption of incremental beliefs lead to increases in academic performance and
125 classroom motivation (Aronson, Fried, & Good, 2001; Aronson et al., 2002; Blackwell et al.,
126 2007). Despite the plethora of research that has been generated within the academic setting,
127 substantially less has been focussed on the sporting domain. Given the differences between
128 the two contexts, it is worth examining the generalizability and applicability of implicit belief
129 research within the sporting domain through a review of research.

130 **Critical Research Findings on Implicit Beliefs within Sports**

131 Research has established the cross-sectional relationship between implicit beliefs of
132 ability and achievement goals within sport and physical activity contexts (Biddle et al., 2003;
133 Cury, Da Fonseca, Rufo, & Sarrazin, 2002; Lintunen, Valkonen, Leskinen, & Biddle, 1999;
134 Ommundsen, 2001; Sarrazin et al., 1996). A review of this literature shows that implicit
135 beliefs about ability are critical elements of all other major theories of motivation, including
136 achievement goal theory, attribution theory, self-efficacy, and intrinsic motivation (Li & Lee,
137 2004). Furthermore, research indicates that implicit beliefs **about** athletic ability are
138 positively associated with enjoyment of physical activity (Biddle et al., 2003). When
139 incremental beliefs about athletic ability are induced participants report more adaptive
140 responses to difficult tasks including greater motivation, self-efficacy, interest, positive
141 affect, and motor development than those who perform the tasks under entity beliefs (Jourden
142 et al., 1991; Kasimatis et al., 1996). Athletes who hold incremental beliefs of athletic ability
143 also show greater rates of skill improvement than their peers (Van-Yperen & Duda, 1999).
144 Lastly, qualitative research with high-performance athletes shows that implicit beliefs have
145 their genesis in a variety of personal, social, and environmental antecedents such as self-
146 reflection, observational-learning, coaching, parenting, and club structure (Slater et al., 2012).

147 **Components of Incremental Beliefs**

148 The six instructional strategies outlined below represent the major components
149 derived from theory and research that we propose for principles of best practice for coaching
150 youth sports. Each instructional strategy has been generated through an operationalization
151 process involving extensive literature review, a modified Delphi process, and expert review.
152 Additionally, each instructional strategy is drawn from a single, underlying, and implicit
153 belief system with the aim of increasing incremental beliefs. As such, the instructional
154 strategies are interdependent and include a degree of conceptual convergence. However, in

155 the youth sport and physical activity context minimizing behaviors that promote entity beliefs
156 is also important because entity beliefs have been associated with greater maladaptive
157 outcomes such as amotivation (Biddle et al., 2003). Where the research is sufficiently strong
158 to make such recommendations, coaching behaviors to be minimized are also suggested. A
159 summary of these principles of best practice appears in Figure 1.

160 **Focus on effort and persistence.** Belief in incremental beliefs of athletic ability in its
161 most basic form is the admission that mastery is under one's own control and is thus
162 dependent on effort and persistence (Dweck, 1999). Those who are oriented toward entity
163 beliefs of athletic ability, however, see hard work and effort as indicators of low levels of
164 ability. At its logical conclusion, this may be reflected in the belief that if one is endowed
165 with natural talent then hard work is unnecessary, and if success is contingent upon effort
166 then one must not be talented. Research indicates that children who hear praise for effort
167 come to believe that the sources of their accomplishments are effort and deliberate practice,
168 whereas children who hear praise for ability come to believe that the sources of their
169 accomplishments are fixed traits (Zentall & Morris, 2010). Instructional strategies may
170 therefore be used to facilitate incremental beliefs of athletic ability by praising effort,
171 persistence, and practice. This is held to be true even in childhood sports where deliberate
172 play, as opposed to deliberate practice, is considered as best practice coaching (Côté, Lidor,
173 & Hackfort, 2012).

174 The promotion and facilitation of deliberate practice may be especially important
175 following a setback, such as losing a match or subpar personal performance. When athletes
176 high in entity beliefs encounter a setback they tend to give up because under this framework
177 failure is indicative of low ability. This "helpless" response is typical of those who hold
178 external control beliefs and may generate low levels of self-efficacy (Lirgg, Chase, George,
179 & Ferguson, 1996). A combination of the belief that ability is a stable entity with low

180 perceived self-efficacy may lead athletes to hold very little hope that effort and hard work
181 will lead to gains in mastery (Ommundsen, 2003).

182 There are many ways for a coach or educator to promote athletes' focus on effort and
183 persistence. Former UCLA basketball coach John Wooden elevated such behaviours to
184 cornerstones of his coaching philosophy. In his 'Pyramid of Success' Wooden advocated for
185 Industriousness and Intentness, pointing out that success travels in the company of hard work,
186 and encouraged his players to 'stay the course' when thwarted, and to persevere relentlessly
187 (Wooden & Jamison, 2004). Other strategies include, where contextually appropriate, young
188 athletes who have worked the hardest to improve at practice earn a starting position.

189 Additionally, the coach should respond to athlete mistakes by giving feedback centred on
190 effort and hard work. For example, the coach may respond to a mistake by providing some
191 technical or tactical correction, followed by a statement regarding the importance of
192 persistent practice in mastering the skill in question. In this way, it is similar to the
193 'sandwich' approach advocated by Smoll and Smith (2009), with an added emphasis on effort
194 and persistence. Research indicates that praise for effort and persistence (process praise), as
195 opposed to praise for ability is associated with the development of incremental beliefs up to
196 five years later (Gunderson, 2013). Further, this research also shows evidence of a dose-
197 response relationship, with more process praise associated with stronger incremental beliefs
198 (Gunderson et al., 2013). Another strategy may be to provide the conditions necessary for
199 deliberate practice, or to encourage multiple attempts at difficult tasks. The coach may do this
200 by allocating large amounts of time to deliberate practice (for example, as opposed to
201 deliberate play), and thus allowing athletes to make explicit attempts to improve their ability.

202 **Challenge.** Those who hold entity beliefs are concerned with outcomes. This
203 manifests itself as an inclination to reject opportunities for learning and improvement
204 provided by difficult tasks (Dweck, 1999; Dweck & Leggett, 1988). Tasks with a high risk of

205 failure may be avoided because ability will be invalidated if failure occurs. This may be
206 particularly so for athletes low in self-efficacy and high in entity beliefs (Ommundsen, 2003).
207 Fry (2000) has shown that, if given the choice, approximately one third of school children
208 aged 5 to 13 years preferred to play an easy game that did not provide challenge. These
209 children are likely to be those at highest risk of displaying maladaptive motivational patterns
210 as a result of entity beliefs (Fry, 2000). In contrast, young people who are high in incremental
211 beliefs seek out the challenge inherent in difficult tasks because challenges provide essential
212 feedback on skills and an opportunity to learn. Thus, the coach may facilitate incremental
213 beliefs of athletic ability through the explicit promotion and facilitation of engagement in
214 appropriately difficult tasks as the means to achievement within a supportive environment.

215 Challenge is one of the most important motives for participation in youth sports
216 (Gould, Feltz, & Weiss, 1985). Researchers have suggested that gains in motivation are
217 optimized when the level of challenge is perceived to be moderately difficult, but not
218 unrealistic (Cox, 2007). Children and adolescents enjoy activities that extend their current
219 skill set, and may become amotivated when required to complete skills over which they have
220 already achieved mastery (Lepper, Master, & Quin Yow, 2008). The coach should set new,
221 challenging goals that provide an opportunity for the mastery of new skills within a mastery
222 climate, and avoid repetition of skills over which children have already achieved mastery. Pat
223 Summitt who won over 1,000 games as coach of the University of Tennessee Women's
224 Basketball team puts it like this: "Setting goals is incredibly important to success. But if you
225 set a goal that seems impossible to achieve - if you go into a year saying your goal is to win
226 the national championship - then you risk losing morale, self-discipline and chemistry if you
227 falter early. Set a goal that stretches you, requires exceptional effort, but one that you can
228 reach" (Yaeger, 2013). Furthermore, according to Morgan and Carpenter (2002) a coach may
229 facilitate and promote engagement in challenge through their behavior and communications,

230 through the practices that they set, or through the climate they create. For example, the coach
231 may praise athletes who unsuccessfully attempt difficult tasks, or they may encourage risk-
232 taking during practice, set training drills that are of moderate difficulty, or facilitate a mastery
233 climate where attempting difficult tasks in the pursuit of mastery is valued.

234 **Value of failure.** A firm belief in the value of failures and setbacks is a core
235 component of incremental beliefs. Dweck (1999) has most poignantly shown this by
236 demonstrating that the performance of children who hold incremental or entity beliefs is
237 parallel until failure occurs. This is due to important adaptive differences in response to
238 failure. Young people high in incremental beliefs see failure as a temporary setback that
239 provides an opportunity for feedback on performance and ability, while young people high in
240 entity beliefs see failure as an enduring indication of low levels of ability (Dweck, 1999).
241 Thus, those high in incremental beliefs respond to failure with adaptive responses such as
242 solution-focussed self-instruction, increased effort, and improved performance. Individuals
243 high in entity beliefs respond to failure with maladaptive responses by attributing failure to
244 low ability, and by exhibiting negative affect, decreased effort, and decreased motivation
245 (Elliott & Dweck, 1988). Therefore, facilitating a belief in the value of failure is a key
246 strategy to promote incremental beliefs in athletic ability. **Alex Ferguson, whose coaching**
247 **tenure at Manchester United Football Club spanned three decades takes this view. He writes**
248 **“Sometimes defeats are the best outcomes. To react to adversity is a quality...If you are**
249 **lackadaisical about defeats you can be sure there will be more to come. Often we would drop**
250 **two points in a game by the opposition equalising with the last kick of the ball and then go on**
251 **a six or seven game winning run. It was not a coincidence” (Ferguson, 2013; p 30). As such,**
252 **Ferguson encapsulates what it means to find value in failure and to use it to improve**
253 **performance.**

254 To understand the value of failure, the skills of monitoring performance, reflecting,
255 and revising learning strategies are important skills for children and adolescents to learn
256 (Larson, 2011). Ommundsen (2003) has found that physical education students who hold
257 incremental beliefs are more likely to plan, monitor, and regulate their cognitions over
258 different learning tasks than their entity belief peers. Pupils who believe that effort, hard
259 work, and persistence lead to mastery also perceive themselves to be more in control of their
260 own learning and are more likely to monitor their goals, adapt, and change their strategy,
261 especially following setbacks (Skinner, 1995). As such, the coach should encourage
262 reflection, and provide a strategy to improve following setbacks. Even a failure that is viewed
263 positively may lead to the helpless response if there is no accompanying strategy for
264 improvement. Strategies may be as simple as increased effort and persistence, or may include
265 technical or tactical reflection. Research also shows that enthusiastic instructors who provide
266 high interaction, supportive feedback, and clear goals that emphasize learning will increase
267 the use of self-regulated learning strategies (Young, 2005). It is also important that the coach
268 does not unreasonably deny mistakes or failures by providing external attributions when
269 failure occurs or promote entity beliefs of athletic ability by providing stable internal
270 attributions to failure. Failures should be accurately attributed to internal, temporary causes
271 where possible, and should be paired with a strategy to address them, preferably focussing on
272 effort. Research has shown that athletes taught to make facilitative attributions to failure are
273 more inclined towards mastery and show greater improvement in performance (Miserandino,
274 1998).

275 **Perception of success.** Children's perceptions of success are critical predictors of
276 motivational and behavioral responses in achievement settings (Lepper et al.,
277 2008). Importantly, those who hold incremental beliefs are more inclined to increase their
278 effort after a failure because they don't perceive "failure" to be a setback, and because they

279 believe that success is derived from effort (Dweck, 1999). In contrast, those high in entity
280 beliefs hold that one must necessarily be endowed with natural talent in order to be
281 successful. Such beliefs lead to maladaptive responses to perceived failures including
282 motivational deficits, withdrawal, and low self-efficacy (Sarrazin et al., 1996). According to
283 Wooden, one may be successful if he or she gives their best effort, even in the absence of
284 success or mastery. This is important because the explicit promotion of effort and persistence
285 has already been advocated. A coach should not promote effort and persistence as the
286 contingencies of success without also adjusting the definition of success. For example, even
287 in the company of extremely hard work, one is not guaranteed to win, nor to achieve mastery
288 if the conditions surrounding such hard work are not conducive to the development of
289 mastery. For example, poorly designed training sessions such as a lack of sufficiently
290 difficult tasks may hinder the development of mastery. In these cases, the athlete must still be
291 able to control his or her own success. If a coach promotes effort and persistence without
292 similarly adjusting their definition of success, youth may be persistent in working hard and
293 yet see little improvement in performance, and thus adopt entity beliefs of athletic ability.

294 As outlined by Lepper and colleagues (2008), young people enjoy activities at which
295 they are able to succeed. However, the motivational powers of feelings of competence are
296 delicate, particularly when success is not attained. When young people feel that the outcome
297 of success is not under one's control they experience the helpless response (Seligman, 1975).
298 Lepper and colleagues (2008) argue, therefore, that feelings of control depend critically on
299 attributions for success that emphasize factors under one's own control, such as effort.
300 Further, externally referenced control beliefs may lead to the assumption that effort and hard
301 work are futile (Ommundsen, 2003).

302 Coach Wooden was able to make success attainable for all by explicitly defining
303 success as giving your best effort, and by maintaining consistency between his behavior and

304 this definition (Wooden & Jamison, 2004). A coach may also facilitate this belief by
305 downplaying the importance of winning, and emphasising the importance of the “process”
306 over “outcome”. For example, a coach who is consistent with this definition will indicate
307 his/her satisfaction with an effortful performance despite losing the game by a big margin.

308 **Promote learning.** The promotion of learning goals and a mastery climate can be
309 effective instructional strategies to induce incremental beliefs about performance. According
310 to Dweck’s Social Cognitive Model of Achievement Motivation incremental beliefs give rise
311 to learning goal orientations (Dweck & Leggett, 1988). This model has been validated within
312 an adolescent physical activity context (Biddle et al., 2003). However, the adoption of a
313 learning goal orientation within sports also predicts the adoption of incremental beliefs,
314 regardless of the extent of adoption of entity beliefs (Sarrazin et al., 1996). Therefore, the
315 promotion of a learning goal orientation can work to facilitate incremental beliefs, even
316 among those who are high in entity beliefs. Furthermore, implicit beliefs can affect
317 motivation to persist at a task, even if the task is non-competitive or has no clear performance
318 criterion, and therefore would not be hindered by the promotion of learning goals (Kasimatis
319 et al., 1996).

320 The benefits of learning goal orientations in youth sport and physical activity contexts
321 are well established. Benefits include increased perceptions of competence, enjoyment,
322 persistence, motivation, and effort, as well as decreased anxiety and immoral behavior
323 (Duda, 2005; Newton & Duda, 1999). Physical educators are able to manipulate the
324 motivational climate towards mastery to induce students’ preference for challenging tasks,
325 satisfaction, positive attitudes, and increases in motor skill development (Morgan &
326 Carpenter, 2002; Robinson, 2011). Additionally, perceptions of a mastery-oriented
327 motivational climate are associated with the belief that motivation or effort is the cause of

328 success. In contrast, perceptions of a performance climate are negatively associated with
329 physical education students' preference for challenging tasks (Treasure et al., 2001).

330 Ames (1992) has provided a comprehensive outline of instructional strategies and
331 structures that support a focus on learning. Task-based instructional strategies include:
332 Design tasks for reasonable challenge; help students establish short-term, self-referenced
333 goals; support the use of effective learning strategies; and, design tasks for novelty, variety,
334 and interest. Authority-based instructional strategies include: Allow students to participate in
335 decision making; provide choices to students where decisions are based on effort; allow
336 students to develop independence; and, support the development of self-management and
337 monitoring skills. Evaluation-based instructional strategies include: Focus on individual
338 improvement, and mastery; make evaluation private and not public; praise students' effort;
339 provide opportunities for improvement; and, encourage a view of mistakes as part of
340 learning. Given the close theoretical ties (Dweck & Leggett, 1988) between implicit beliefs
341 and goal orientations, it is unsurprising that there is some overlap between the strategies
342 provided by Ames (1992) and those suggested here.

343 **High expectations.** The explicit provision of appropriately high expectations that are
344 above current achievement levels send strong messages to youth that abilities are incremental
345 because they involve the need for improvement. Furthermore, children and adolescents can
346 be transformed through the provision of such expectations (Dweck, 2006). Indeed, high
347 expectations are an integral mechanism by which implicit beliefs work to increase goal
348 attainment (Burnette et al., 2013). It is hypothesized that providing high performance
349 expectations serve to increase self-efficacy (Avolio & Bass, 2002). More specifically, Slater
350 and colleagues (2012) suggest that, consistent with Bandura's Self Efficacy Theory (Bandura,
351 1997), providing high expectations may allow the athlete to experience positive performance
352 accomplishments and vicarious experiences which serve to increase self-efficacy and

378 acquisition in youth sport and physical activity contexts (Biddle et al., 2003; Jourden et al.,
379 1991; Kasimatis et al., 1996; Van-Yperen & Duda, 1999). This paper has proposed a
380 theoretically-derived, evidence-based, and conceptually-related set of instructional strategies
381 that may be used to promote incremental beliefs of athletic **ability** in these contexts and
382 thereby facilitate adaptive outcomes for young people. Given the prominence of implicit
383 belief research in the developmental, educational, and motivational literature the omission of
384 theoretically-informed instructional strategies represents a substantial gap in knowledge. The
385 addition of instructional strategies to the literature can help to generate new research
386 questions and may have important implications and applications to sport pedagogy.

387 **While the instructional strategies that have been articulated above represent a novel**
388 **application of theory to the youth sports context, it is notable that there is some overlap**
389 **between these strategies and those presented within other approaches to coaching. Most**
390 **notably, the Mastery Approach to Coaching (Smoll & Smith, 2009) has as its central concept**
391 **the promotion of learning. Related concepts also include an emphasis on the informational**
392 **content of praise, and the definition of success by self-referenced means. However, given the**
393 **close theoretical links between implicit beliefs and goal orientations (Dweck & Leggett,**
394 **1988) this is perhaps unsurprising. Similarly, the transformational leadership approach to**
395 **coaching in youth sports (Vella, Oades, & Crowe, 2012) and the autonomy-supportive**
396 **coaching approach (Mageau & Vallerand, 2003) both share common instructional strategies**
397 **with those presented here. These include the promotion of challenge and provision of**
398 **contextually-appropriate high performance expectations. The extent to which these four**
399 **approaches are distinct, as well as any potential common mechanisms by which each**
400 **approach works to increase motivation are still unknown.**

401 **Although we have adopted a lay definition of ability and have made no distinction**
402 **between ability and skill, the two have been considered as distinct constructs (Schmidt &**

403 Lee, 2011). Our approach has been consistent with over two decades of research in implicit
404 beliefs (Dweck & Leggett, 1988), however, a more nuanced approach to terminology and
405 measurement of implicit beliefs is required in the future. For example, it is unclear whether
406 children can distinguish between the constructs of skill and ability, and if so, are implicit
407 beliefs about ability or skill more predictive of motivation? These are important theoretical
408 and applied issues that warrant further investigation.

409 Implementation of the six instructional strategies outlined above would require that
410 youth sport coaches relinquish an emphasis on winning. Given the importance that is
411 typically placed upon winning by athletes, parents, and administrators, this may be a difficult
412 task for coaches. We have outlined empirical evidence which documents that the instructional
413 strategies lead to adaptive behaviours such as effort, persistence, and practice, which are in
414 turn important predictors of performance. However, coaches may need additional support to
415 implement these strategies. Given that theoretically-based approaches to coach education
416 have been poorly applied in the empirical literature (Langan, Blake, & Lonsdale, 2013), it is
417 currently unclear what the most effective way to support coaches in implementing such
418 changes may be.

419 The first task for future research is to validate the instructional strategies as effective
420 in increasing incremental beliefs within sports settings. Development of sensitive
421 instrumentation to collect reliable data is a first step in accomplishing this task. A tool to
422 systematically observe instructional strategies may be especially important for research in
423 settings where children are too young to complete self-report measures. Questions of
424 particular importance are: ‘how influential is the coach in the genesis of implicit beliefs about
425 sporting ability, especially in comparison with other social influences such as parents?’; ‘do
426 coaches of younger athletes have a greater influence?’; and, ‘how long lasting is the impact of
427 the coach?’. An avenue for future research may be the use of the framework provided by

428 these instructional strategies to aid coach development. Moulding coaching behaviors
429 according to this framework is a priority, examining its impact on theory-driven outcomes for
430 young people such as motivation, persistence (including dropout), and goal orientations
431 within sport and physical activity. Also of importance is research that can examine potential
432 susceptible periods and contexts for the development of implicit beliefs. For example, is the
433 impact of a young athlete's first coach greater than that of subsequent coaches? Questions
434 such as this may become especially important in the near future given the broad array of
435 psychosocial and health benefits that are a result of participation in organized sports during
436 childhood (Fraser-Thomas et al., 2005).

437

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