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6 **Motivation and Self-Enhancement as Antecedents of Implicit Theories in Youth Sport**

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9

10 **Abstract**

11 We explored motivation, and specifically the motivation to see oneself in a positive light, as
12 an antecedent of implicit theory endorsement in two youth sport contexts. Data from two
13 studies that represent four samples are reported. We provide the first evidence of an
14 antecedent of implicit theories in the physical domain and show that young people's implicit
15 theories may be shaped by motivation and self-enhancement. In both contexts, we found that
16 strengths were viewed as more malleable than their weaknesses, and that these differences
17 disappeared when considering the same attributes in others. Moreover, in one context, we
18 showed that desire to change a perceived weakness may act as a self-protective motive
19 against the potentially negative effects of beliefs about its stability. The current study
20 enhances our understanding of how implicit theories may be shaped in young people through
21 identifying internal factors that promote the endorsement of these important motivational
22 constructs.

23 *Keywords:* implicit theories, motivation, self-enhancement, youth sport, physical
24 education

25 **Motivation and Self-Enhancement as Antecedents of Implicit Theories in Youth Sport**

26 Beliefs about stability and change and their effects on motivation, personality and
27 development are well-established. The extant literature, across a range of areas such as
28 intelligence (Dweck, 1999), interpersonal relationships (Burnette & Franiuk, 2010), social
29 perception (Molden, Plaks & Dweck, 2006), personality (Spinath, Spinath, Riemann &
30 Angleitner, 2003), body weight (Burnette, 2010) and athletic ability (Spray, 2017), is replete
31 with evidence showing the positive effects of believing that attributes and behaviours can
32 change, and the negative effects of believing that attributes and behaviours are fixed.
33 However, despite these far-reaching effects across human attributes and behaviours, we know
34 very little about the factors that influence individuals to endorse beliefs about stability or
35 change. This is particularly apparent in the physical domain, where no evidence exists as to
36 what shapes beliefs about the malleability of physical attributes and behaviours. Given the
37 role of the physical domain in young people achieving positive health and well-being
38 outcomes, there is a need to understand how these important motivational constructs are
39 developed and how they can be influenced. In this paper we address this important and
40 understudied issue of the antecedents of implicit theories of physical attributes across two
41 youth sport contexts.

42 **Meaning Systems and Implicit Theories**

43 The meaning systems approach advocated by Dweck (1999, 2017) places beliefs
44 about stability and change at the heart of an individual's motivational framework. These
45 beliefs have a central role in shaping the perceptual lens through which individuals
46 understand and process information about themselves, other people, and the world around
47 them. In competence-relevant situations, such as youth sport, beliefs about stability and
48 change provide the framework for the individual about what it means to be competent and
49 whether the emphasis is on competence validation or competence acquisition (Dweck &

50 Molden, 2017). Across all domains in which beliefs about stability and change (i.e. implicit
51 theories¹) have been of interest, the existence of two implicit theories, incremental and entity,
52 has been supported (see Dweck, 1999; Dweck & Molden, 2017). Beliefs about malleability
53 are embodied in an incremental implicit theory in which attributes and behaviours are viewed
54 as potentially changeable and can be developed through learning. Incremental beliefs foster a
55 meaning system that orientates the individual towards developing their attribute and a focus
56 on competence acquisition. On the other hand, beliefs about stability are embodied in an
57 entity implicit theory in which attributes and behaviours are viewed as fixed and stable. The
58 meaning system associated with this belief orientates the individual towards seeking to gain
59 favourable judgements of their attribute and a focus on competence validation.

60 Evidence has consistently supported how the meaning systems associated with
61 implicit theories differentially shape individuals' cognitions, affect, and behaviour and the
62 outcomes they experience (Burnette, O'Boyle, VanEpps, Pollack, & Finkel, 2013; Dweck &
63 Molden, 2017). Incremental beliefs have been associated with a range of adaptive outcomes,
64 (e.g., mastery goals, positive effort beliefs and attributions, improved grades, determination,
65 enthusiasm, lower stress, and mastery-oriented strategies, Blackwell, Trzesniewski, &
66 Dweck, 2007; Robins & Pals, 2002; Yeager et al., 2014), while entity beliefs have been
67 associated with negative outcomes (e.g., performance avoidance goals, negative effort
68 beliefs, ability attributions, poorer grades, greater stress and shame, and helpless-oriented
69 strategies, Blackwell et al., 2007; Robins & Pals, 2002; Yeager et al., 2014). In the physical
70 domain an extensive literature has supported implicit theories as an important motivational
71 construct for young people (Spray, 2017). A systematic review and meta-analysis of research
72 in sport, physical activity, and physical education (PE; Vella, Braithwaite, Gardner, & Spray,

¹ Since 2006 Dweck has referred to implicit theories as mindsets, using the terms growth and fixed to represent the two implicit theories evident in the research literature.

73 2016), revealed that incremental beliefs were positively associated with a task orientation,
74 mastery goals, mastery climate, intrinsic and autonomous motivation, perceived competence,
75 and enjoyment, and negatively associated with a performance climate. On the other hand,
76 entity beliefs were positively associated with an ego orientation, performance goals, and a
77 performance climate, but negatively associated with a mastery climate and intrinsic and
78 autonomous motivation, and showed no relationship with perceived competence and
79 enjoyment. However, despite this wealth of evidence across domains for the two implicit
80 theories and their important role in shaping experiences and responses, there is limited
81 evidence about how these beliefs about stability and change are developed (Dweck, 2017).
82 This is particularly evident in the physical domain, where there is no evidence that addresses
83 the development of implicit theories of physical attributes and behaviours.

84 **Antecedents of Implicit Theories**

85 Across the research literature implicit theories have themselves been shown to be
86 malleable through both experimental priming practices (e.g., Miele & Molden, 2010; Murphy
87 & Dweck, 2010; Nussbaum & Dweck, 2008; Spray, Wang, Biddle, Chatzisarantis &
88 Warburton, 2006) and real-world intervention training programmes (e.g., Blackwell et al.,
89 2007; Yeager et al., 2019). Although this work is yielding interesting findings particularly
90 with regards to young people's achievement (Yeager et al., 2019), there are still groups of
91 individuals for whom the interventions and manipulations have limited effects (Dweck,
92 2017). A greater understanding of the factors that influence implicit theory endorsement is
93 therefore a priority for research if we are to maximise the potential for implicit theory
94 interventions and their effects.

95 The limited evidence that does exist on the antecedents of beliefs about stability and
96 change in young people has been confined to the educational (e.g., Cimipian, Arce, Markman
97 & Dweck, 2007; Kamins & Dweck, 1999; Mueller & Dweck, 1998) and parenting (e.g.,

98 Gunderson et al., 2013; Gunderson et al., 2018; Haimovitz & Dweck, 2016) domains. This
99 evidence suggests that socialisation practices such as the type of praise and criticism a child
100 receives from both teachers (Kamins & Dweck, 1999; Mueller & Dweck, 1998) and parents
101 (Gunderson et al., 2013) can have an impact on an individual's implicit theory. In this
102 research, process praise and strategic criticism have been associated with the endorsement of
103 incremental beliefs, whereas person praise and person-orientated criticism have been
104 associated with the adoption of entity beliefs. Interestingly, longitudinal work has shown that
105 the positive effects of process praise to toddlers from their parents was associated not only
106 with an incremental motivational framework 5 years later (Gunderson et al., 2013) but also
107 their academic achievement 7 years later (Gunderson et al., 2018). Moreover, across a series
108 of studies, parents' responses to failure have also been found to influence implicit theory
109 endorsement (Haimovitz & Dweck, 2016). Parents who viewed failure as debilitating and
110 reacted with concern and anxiety about their child's intelligence fostered entity beliefs in
111 their child, while those who viewed failure as enhancing and an opportunity for learning and
112 growth fostered incremental beliefs in their child. It is evident from this research that young
113 people's implicit theories can be influenced by external factors.

114 More recently, however, research has shown that adults' implicit theories can also be
115 actively self-regulated and thus influenced by internal factors (Leith et al., 2014; Steimer &
116 Mata, 2016). In this research, motivational factors and in particular the motivation to see
117 oneself in a positive light were identified as antecedents of implicit theory endorsement
118 (Leith et al., 2014; Steimer & Mata, 2016). Across seven studies Leith et al. (2014)
119 demonstrated that when individuals were motivated by a goal (i.e., protecting the self or a
120 relevant other), they would shift their implicit theory in the service of the goal. For example,
121 in their first three studies when individuals were faced with information about their failures,
122 they adopted an incremental view of their intelligence which served to protect a favourable

123 view of themselves, as an entity theory would suggest that the failure in intelligence would be
124 long-lasting. Moreover, they resisted a shift to a perspective of stability after failure even
125 when information was presented suggesting stability of their characteristic. The desire to
126 protect the self, therefore, motivated an individual's implicit theory endorsement more so
127 than the external priming.

128 Recent research has extended these findings to motivated implicit theories of
129 personality (Steimer & Mata, 2016). In their first two studies, adults in a high self-relevance
130 condition reported differences in their beliefs about the malleability of their own strengths and
131 weaknesses, with their weaknesses being perceived as more malleable than their strengths.
132 Interestingly, this difference was found to be accounted for by desire for change, with adults
133 reporting a stronger desire to change their weaknesses than their strengths. Moreover, in study
134 2, individuals adjusted their implicit theory in the service of self-enhancement as the
135 differences in implicit theory endorsement disappeared when adults were asked to consider the
136 strengths and weaknesses of other people (low self-relevance condition). Collectively, this
137 work on motivated implicit theories opens up interesting opportunities for further research
138 regarding the antecedents of individuals' beliefs. As yet, there has been no research in any
139 implicit theory area which has examined motivated implicit theories in young people. Given
140 that young people are more likely to self-enhance than older adults (Foster, Campbell, &
141 Twenge, 2003) this would seem to be an important avenue to explore in our quest to design
142 effective interventions to influence young people's motivation, well-being and achievement.
143 Consequently, given the dearth of research in the physical domain on any antecedents of
144 implicit theories, the alignment of the highly public evaluation of competence in this domain
145 with self-presentation and self-enhancement strategies, and the importance of the physical
146 domain to wider health and well-being outcomes, exploring motivated implicit theories of
147 young people in the physical domain is of critical importance.

148 The Present Research

149 The purpose of the present research was to explore how motivation, and specifically
150 the motivation to see oneself in a positive light influenced young people's implicit theory
151 endorsement in two youth sport contexts. Moreover, we sought to explore whether young
152 people strategically shaped their beliefs in the service of self-enhancement in the context of PE
153 and sport. We explored the antecedents of implicit theories in two studies that represented both
154 a general (physical education) and a specific competitive youth sport context (gymnastics).
155 This approach provides a robust test of motivated implicit theories because: 1) implicit theories
156 have been found to be important motivational constructs for young people at both the physical
157 domain- and activity-specific level (Warburton & Spray, 2017); 2) at the activity-specific level
158 research suggests that the same individual can hold different implicit theories of their sporting
159 ability for different activities (Spray & Warburton, 2003). Individuals participating in games
160 activities were more likely to endorse a belief of malleability and when participating in
161 gymnastics activities were more likely to endorse a belief of stability; and 3) the two contexts
162 represent both a compulsory and voluntary youth sport setting. Young people are likely to
163 experience both of these contexts as part of their youth sport experiences and thus, if motivated
164 implicit theories are evident in both types of youth sport settings, stronger evidence is provided
165 for their role as antecedents of implicit theory endorsement. We also chose a youth sport
166 activity (gymnastics) in which young people have been found to be more likely to hold entity
167 beliefs about their ability (Spray & Warburton, 2003) to minimise the desirability of an
168 incremental belief and again contribute to a stronger test of motivation as an antecedent of
169 implicit theories.

170 As this is the first research to explore motivated implicit theories in young people we
171 drew from the previous work on adults (Leith et al., 2014; Steimer & Mata, 2016) to offer
172 hypotheses for both studies. We used the established practice in research of comparing high

173 versus low self-relevant conditions for demonstrating self-enhancing tendencies (Alicke &
174 Sedikides, 2009). We hypothesised that when self-relevance was high: 1) students/gymnasts
175 would view their strengths as stable and their weaknesses as malleable; 2) students/gymnasts
176 would have a greater desire to change their weaknesses than their strengths; 3)
177 students/gymnasts would expect more future improvement in their weaknesses than their
178 strengths; and 4) desire for change would mediate the effect of motivation on implicit theory
179 endorsement. However, when self-relevance was low (i.e., with reference to other students or
180 gymnasts), we expected there to be no differences for any of the dependent variables in how
181 students/gymnasts viewed strengths and weaknesses.

182 **Study 1: Motivated Implicit Theories in Physical Education Students**

183 Study 1 sought to address the limited evidence for antecedents of implicit theories in
184 the physical domain. We explored whether students in PE engaged in motivational and self-
185 enhancement processes in the endorsement of implicit theories, and if they did so in the same
186 way as adults. In sample 1 we examined whether there was a motivational influence on
187 implicit theories, desire for change and direction of change by manipulating the desirability
188 of the components of fitness that underpin sport performance. This sample represented the
189 high self-relevance condition as all variables were assessed in relation to young people's own
190 strengths and weaknesses. The second sample represented the low self-relevance condition as
191 students completed the study in relation to their views about the strengths and weaknesses of
192 others of the same age. This is a frequently used control condition to demonstrate self-
193 enhancing tendencies (Alicke & Sedikides, 2009). We used this second sample to explore if
194 there was evidence of self-enhancement processes motivating PE students' views about the
195 stability, desire for change, and direction of future improvement in components of their
196 fitness.

197 **Method**

198 Participants

199 Two independent PE samples were collected for study one. Sample 1 consisted of 161
200 PE students (female: $n = 73$; male: $n = 88$) while sample 2 consisted of 157 PE students
201 (female: $n = 76$; male: $n = 81$) from secondary schools in the United Kingdom. The students
202 were aged between 11 and 13 years in both samples (Sample 1: $M = 12.50$, $SD = 0.46$;
203 Sample 2: $M = 12.48$, $SD = 0.47$) and were in school years 7 and 8 (Sample 1: Year 7: $n =$
204 100 ; Year 8: $n = 61$; Sample 2 Year 7, $n = 100$; Year 8, $n = 57$). The majority of students were
205 white (Sample 1: 87%; Sample 2: 89%) and students were taught in single-sex, mixed ability
206 classes for PE. Data were collected during summer term activities such as athletics, rounders
207 and cricket. A sensitivity analysis revealed that the power level afforded by our final sample
208 sizes at 80% power and $\alpha = .05$ was $f = .16$ or larger.

209 Procedure

210 In both samples, ethical approval for the research procedures was obtained from a
211 university review board and followed the guidelines of the British Psychological Society and
212 the Declaration of Helsinki. Informed consent was provided by all participants. Trained
213 research assistants, who led the data collection sessions and were available to answer any
214 questions, collected data in the summer term of the school year. At the start of a normal
215 curriculum PE lesson, students completed an anonymous multi-section questionnaire, which
216 took approximately 15 minutes to complete in quiet classroom conditions. The research
217 assistants were available to support any student with reading the items of the questionnaire.
218 In both samples, participants were first asked to name a strength or a weakness that they
219 themselves were believed to have, making the target traits in both samples self-generated. In
220 sample 1, students completed the questionnaire in relation to their perceptions about their
221 own strengths and weaknesses (high self-relevance) but in sample 2 students were requested

222 to answer the questions in relation to their perceptions about the strengths and weaknesses of
223 other students of the same age (low self-relevance).

224 **Measures**

225 Participants in both samples completed a multi-section questionnaire that collected
226 the following information.

227 *Personal Details*

228 Data collected included; sex, date of birth, and ethnicity.

229 *Self-Generated Strengths and Weaknesses*

230 Participants were asked to select a trait from a list of health-related and skill-related
231 fitness components (e.g., agility, endurance, flexibility, power, speed, balance, coordination,
232 strength and reaction time) that they were satisfied (e.g., a strength) versus dissatisfied with
233 (e.g., a weakness).

234 *Implicit Theories*

235 Participants indicated their beliefs about the malleability of their self-generated
236 strength and weakness, for either themselves (sample 1) or other students (sample 2) using
237 the stability sub-scale of the Conceptions of the Nature of Athletic Ability Questionnaire
238 Version 2 (CNAAQ-2; Biddle, Wang, Chatzisarantis, & Spray, 2003). The scale consisted of
239 three items answered on a five-point Likert scale using the anchor points from strongly
240 disagree (1) to strongly agree (5). An example item is 'I have a certain level of ability in this
241 component of fitness and I cannot really do much to change that level'. The stability sub-
242 scale has reported good reliability and validity with internal consistencies ranging from .77 to
243 .81 (Wang & Liu, 2007; Biddle et al., 2003).

244 *Direction of Future Change*

245 To measure direction of expected future change we used the item from Steimer and
246 Mata (2016). Participants indicated whether they expected their own (or other students)

247 strengths and weaknesses to either ‘get much worse’ or ‘get much better’ in the future on a
248 five-point Likert scale (‘stay the same’ was the mid-point). An example item for the self-
249 referenced sample is ‘In the future I believe this component of fitness will...’ and for the
250 other-referenced sample ‘In the future I believe that for other children of my age this
251 component of fitness will...’

252 *Desire for Change*

253 To measure desire for change we used the items from Steimer and Mata (2016).
254 Participants indicated how important it was for them (or other people) to change and how
255 much they (or other students) would like to change with regards to their strength and
256 weakness, using a five-point Likert scale (1= not at all, 5 = extremely). An example item for
257 self-referenced is ‘How important is it for you to be able to change this component of
258 fitness?’ and for other-referenced ‘How much would other children of my age like to change
259 in this component of fitness?’ Steimer and Mata (2016) found good reliability scores for both
260 strengths and weaknesses of .72.

261 **Data Analysis**

262 Data analysis was carried out using the Statistical Package for Social Sciences
263 (SPSS), version 25 software. In both samples, data were screened for outliers using the values
264 of more than 3.29SD above or below the mean, no outliers were identified or removed from
265 either sample. Means, standard deviations and correlations were computed for all variables.
266 Correlations between implicit theory, desire for change, and direction of change were
267 assessed in each samples to evaluate the suitability of using MANOVA (Meyers, Gamst, &
268 Guarino, 2016). For both studies, an a priori power analysis using G*Power software (Faul et
269 al., 2007) indicated a minimum sample size of N = 65 could test a medium effect size (f =
270 .25) at the level of $\alpha = .05$ and a power level of .80 for MANOVA.

271 *Demographic Differences*

272 To identify any differences between sex and year groups in both samples, two, three-
273 way MANOVA tests were conducted. Trait desirability (strength vs. weakness), sex (male vs.
274 female), and year group (year 7 vs. year 8) were the independent variables and implicit
275 theory, desire for change and direction of change were the dependent variables. No
276 significant main or interaction effects for sex or year group differences were found in either
277 sample ($ps >.05$). All subsequent analyses were conducted on the whole sample (males,
278 females, year 7 and year 8 combined).

279 *Main Analyses*

280 In sample 1 (the high self-relevance sample), a one-way repeated measures
281 MANOVA was conducted to determine if there was a significant difference between PE
282 students' perceptions of the malleability, desire for change, and direction of future change of
283 their own strengths compared to their weaknesses. This was replicated in sample 2, (the low
284 self-relevance sample) to determine if there was a significant difference between PE students'
285 perceptions of the malleability, desire for change, and direction of future change of other
286 students' strengths compared to their weaknesses.

287 In both samples, if a motivational effect of trait desirability on implicit theories was
288 evident along with an effect on either desire for change or direction of future change,
289 mediation analyses were carried out. The MEMORE procedure for SPSS (10,000 resamples),
290 Version 2.Beta 3, model 1 (Montoya & Hayes, 2017) was used to examine whether a stronger
291 desire or direction (as indicated from previous analyses) mediated the motivational effect on
292 implicit theories.

293 **Results**

294 **High Self-Relevance PE Sample: Motivation as an Antecedent**

295 *Descriptive Results*

296 Table 1 presents the means, standard deviations and correlations for all variables in both PE
297 samples. All mean scores were above the scale mid-point. The mean scores for implicit
298 theory and direction of change were higher for weaknesses than strengths suggesting that
299 students in PE perceived greater stability in their weaknesses than their strengths and
300 expected more future improvement in their weaknesses than their strengths. The mean score
301 for desire for change was higher for strengths than weaknesses indicating that students in PE
302 wanted to change their strengths more than weaknesses.

303 All strength variables were moderately, positively correlated with the opposite
304 weakness variable, for example implicit entity theory for strength had a significant moderate,
305 positive association with implicit entity theory for weakness. Within both the strength or
306 weakness variables separately, implicit entity theory had a significant small, negative
307 association with both desire to change and direction of future change. For example, implicit
308 entity theory for weakness had a small negative association with both desire to change and
309 direction of future change for weaknesses. Desire for change was moderately and positively
310 associated with direction of future change, for example, desire to change strength had a
311 moderate, positive association with direction of future change strength.

312 *Differences in Implicit Theories, Desire, and Direction of Change*

313 A one-way, within-person, repeated measures MANOVA tested whether motivation
314 was an antecedent of PE students' perceptions of the malleability, desire for change, and
315 direction of future change of their own strengths compared to their weaknesses. The
316 MANOVA, with trait desirability (strength vs. weakness) as the independent variable and
317 implicit theory, desire for change, and expected direction of future changes as the dependent
318 variables, revealed a significant multivariate effect for trait desirability on the dependent
319 variables ($F_{(3,158)} = 6.13$, $p = .001$, $\eta^2 = .104$). Specifically, there was a significant effect for
320 both implicit entity theory ($F_{(1,160)} = 3.76$, $p = .054$, $\eta^2 = .023$, 95% confidence interval of

321 Table 1. Means, standard deviations and correlations between all measured variables in the Physical Education Samples.

										322
<i>Physical Education: High Self-Relevance</i>										323
Variable	M	SD	Range	1.	2.	3.	4.	5.	6.	324
1. Implicit Entity Theory Strength	2.69	1.09	1-5	-						325
2. Desire Strength	3.40	.89	1-5	-.375**	-					326
3. Direction Strength	.49	.86	-2-2	-.225**	.530**	-				327
4. Implicit Entity Theory Weakness	2.85	1.06	1-5	.516**	-.283**	-.105**	-			328
5. Desire Weakness	3.25	.89	1-5	-.253**	.463**	.148	-.261**	-		329
6. Direction Weakness	.61	.85	-2-2	-.189*	.256**	.455**	-.191*	.402**		330
<i>Physical Education: Low Self-Relevance</i>										331
Variable	M	SD	Range	1.	2.	3.	4.	5.	6.	332
1. Implicit Entity Theory Strength	2.72	1.06	1-5	-						333
2. Desire Strength	3.34	.74	1-5	-.305**	-					334
3. Direction Strength	.36	.69	-2-2	-.300**	.425**	-				335
4. Implicit Entity Theory Weakness	2.82	.95	1-5	.167*	-.101	-.215**	-			336
5. Desire Weakness	3.28	.88	1-5	-.118	.259**	.136	-.424**	-		337
6. Direction Weakness	.50	.77	-2-2	-.150	.080	.284**	-.388**	.423**		338
										339
										340
										341
										342
										343

344 Notes: ** $p \leq 0.01$; * $p \leq 0.05$.

345

346 the difference (CI_{diff}) = [-.33, .00]) and desire for change ($F_{(1,160)} = 4.73, p = .031, \eta^2 =$
347 $.029, 95\% \text{ CI}_{\text{diff}} = [.02, .30]$), but not for direction of future change ($F_{(1,160)} = 2.83, p = .094,$
348 $\eta^2 = .019, 95\% \text{ CI}_{\text{diff}} = [-.26, .02]$). Students reported greater stability in their own
349 weaknesses ($M = 2.85$) than their own strengths ($M = 2.69$), thus motivation was found to be
350 an antecedent of implicit theory endorsement. Students also reported a greater desire for
351 change in their own strengths ($M = 3.40$) than their own weaknesses ($M = 3.25$), but no
352 difference in their expectations for future improvement between their weaknesses ($M = .61$)
353 than their strengths ($M = .49$).

354 *Mediating the Effect of Motivation as an Antecedent of Implicit Theories*

355 Our mediation analysis explored whether the perception of greater malleability in PE
356 students' strengths than their weaknesses was explained by a greater desire to change their
357 strengths than their weaknesses. Overall, there was evidence of a total effect of trait
358 desirability on implicit entity theory, with students being -0.16 units lower on implicit entity
359 theory for their strengths than their weaknesses ($p < .001$). Strengths were rated 0.16 units
360 higher on desire for change than weaknesses ($p = .031$), but there was no difference for a one
361 unit increase in desire for change on implicit entity theory ($p = .203$) and thus no dependence
362 on trait desirability ($p = .442$). The effect of trait desirability on implicit entity theory through
363 desire for change was not different from zero ($ab = -0.02, 95\% \text{ Bootstrap confidence interval}$
364 $[-.07, .11]$). This means that there was no difference in students' implicit entity theory,
365 through the effect of trait desirability on desire for change, and the subsequent effect of desire
366 for change on implicit entity theory. There was no significant direct effect between trait
367 desirability and implicit entity theory ($c' = -0.14, p = .092$). Thus, there was no evidence of a
368 mediation effect of desire for change on implicit entity theory for strengths and weaknesses.

369 **Low Self-Relevance PE Sample: Self-Enhancement as an Antecedent**

370 *Descriptive Results*

371 All mean scores were above the scale mid-point. The mean scores for implicit theory
372 and direction of future change were slightly higher for weaknesses than strengths suggesting
373 that students in PE perceived greater stability in other students' weaknesses than other
374 students' strengths and expected more future improvement in other students' weaknesses than
375 their strengths. The mean score for desire for change was higher for strengths than
376 weaknesses indicating that students reported that other students in PE would want to change
377 their strengths more than weaknesses. These differences in these scores are in the same
378 direction as those in the self-referenced sample.

379 All strength variables had a small, positive correlation with the opposite weakness
380 variable, for example implicit entity theory for strength had a significant small, positive
381 association with implicit entity theory for weakness. For strengths, implicit entity theory had
382 a significant small, negative association with both desire to change and direction of future
383 change. For example, implicit entity theory for weakness had a small negative association
384 with both desire to change and direction of future change for weaknesses. While for
385 weaknesses, implicit entity theory had a small to moderate negative association with both
386 desire and direction for future change. Among both the strength and weakness variables,
387 desire for change was moderately and positively associated with direction of future change,
388 for example, desire to change strength had a moderate, positive association with direction of
389 future change strength.

390 *Differences in Implicit Theories, Desire, and Direction of Change*

391 A one-way, within-person, repeated measures MANOVA tested whether motivation
392 was an antecedent of PE students' perceptions of the malleability, desire for change, and
393 direction of future change of other students' strengths compared to their weaknesses. The
394 MANOVA, with trait desirability (strength vs. weakness) as the independent variable and
395 implicit theory, desire for change, and expected direction of future change as the dependent

396 variables, revealed no significant multivariate effect for trait desirability on the dependent
397 variables ($F_{(3,154)} = 2.42, p = .069, \eta p^2 = .045$). Students reported no differences in implicit
398 entity theory, expectation for future improvement or desire for change when reporting on the
399 strengths and weaknesses of other children their age. Motivation was therefore not an
400 antecedent of implicit theory endorsement when reporting on other children of their age.
401 Consequently, no mediation analyses were completed for this sample.

402 **Brief Discussion**

403 Study 1 provides evidence for motivation as an antecedent of implicit theory
404 endorsement with students in PE holding different implicit theories for their own strengths
405 and weaknesses. These findings were counter to those of Steimer and Mata (2016) on adults'
406 implicit theories of personality characteristics as students perceived their strengths as more
407 malleable than their weaknesses. Students also reported a greater desire to change their
408 strengths than weaknesses, also counter to the work of Steimer and Mata (2016), but
409 consistent with the students' implicit theories of their physical attributes. However, despite
410 this consistency, desire to change did not explain the effect of motivation on the endorsement
411 of different implicit theories. Finally, study 1 also provided preliminary evidence that
412 students' implicit theory endorsement was motivated by self-enhancement as the differences
413 in implicit theory endorsement disappeared when considering the strengths and weaknesses
414 of other students of the same age. Study 1 therefore provides initial evidence for both a
415 motivational and a self-enhancement effect on implicit theory endorsement.

416 **Study 2: Motivated Implicit Theories in Youth Gymnasts**

417 In study 2, we explored whether the motivational and self-enhancement influence on
418 implicit theory endorsement was extended from a generalised compulsory PE context to a
419 specific voluntary sport activity (youth sport gymnastics). We replicated the collection of
420 data from study 1 by using two samples representing a high and low self-relevance condition,

421 the first sample explored whether there was a motivational influence on implicit theories,
422 desire for change and direction of change by manipulating the desirability of the components
423 that underpin gymnastic ability. This sample were in a high self-relevance condition as all
424 variables were assessed in relation to their own strengths and weaknesses. The second sample
425 were in a low self-relevance condition as they completed the study in relation to their views
426 about the strengths and weaknesses of other gymnasts of the same age. We used this second
427 sample to explore if there was evidence of self-enhancement processes motivating gymnasts'
428 views about the stability, desire for change, and direction of future improvement in their
429 gymnastic ability.

430 As the findings from study 1 were counter to the existing adult literature on motivated
431 implicit theories we drew from these to offer revised hypotheses for this activity specific
432 study. We anticipated that in the high self-relevance condition: 1) gymnasts would view their
433 weaknesses as stable and their strengths as malleable; 2) gymnasts would have a greater
434 desire to change their strengths than their weaknesses; 3) there would be no difference in the
435 expectation of future improvement in their strengths and weaknesses; and 4) we did not
436 expect desire for change to mediate the effect of motivation on implicit theory endorsement.
437 For the low self-relevance condition we expected there to be no differences in strengths and
438 weaknesses for any of the dependent variables.

439 **Method**

440 **Participants**

441 Two independent gymnastics samples were collected for study two. Sample 1
442 consisted of 59 gymnasts (female: $n = 56$ female; male $n = 3$) while sample 2 consisted of 96
443 gymnasts (female: $n = 90$ female; male: $n = 6$) from a gymnastics centre in the United
444 Kingdom. The gymnasts were aged between 11 and 16 years in sample 1 ($M = 12.47$, $SD =$
445 1.56) and 7 and 16 years in sample 2 ($M = 11.05$, $SD = 2.30$). The majority of participants

446 were competing at county or regional level (Sample 1: 61%; Sample 2: 77%). In sample 1,
447 the gymnasts had been participating in gymnastics for between 3 and 12 years ($M = 7.11$, SD
448 $= 2.11$) and trained between 4 and 23 hours per week ($M = 11.28$, $SD = 5.35$). In sample 2,
449 the gymnasts had been competing in gymnastics for between 1 and 12 years ($M = 3.68$, $SD =$
450 2.62) and trained between 5 and 25 hours per week ($M = 11.90$, $SD = 5.97$). A sensitivity
451 analysis revealed that the power level afforded by our final sample sizes at 80% power and α
452 $= .05$ was $f = .26$ or larger for sample 1, and $f = .20$ or larger for sample 2.

453 **Procedure**

454 In both samples, ethical approval for the research procedures was obtained from a
455 university review board and followed the guidelines of the British Psychological Society and
456 the Declaration of Helsinki. Informed consent was provided for all participants. Trained
457 research assistants who led the data collection sessions and were available to answer any
458 questions collected data at the participating gymnastics centres. Gymnasts were provided
459 with an anonymous multi-section questionnaire to complete during a gymnastics training
460 session. The questionnaire took approximately 15 minutes to complete and a research
461 assistant was available to support any of the younger gymnasts with reading the items of the
462 questionnaire. As with study 1, gymnasts in both samples were first asked to name a strength
463 or a weakness that they believed they possessed, making the target traits in both samples self-
464 generated. Gymnasts completed the questionnaire in relation to their perceptions about their
465 own strengths and weaknesses (sample 1) or in relation to their perceptions about the
466 strengths and weaknesses of other gymnasts of the same age (sample 2).

467 **Measures**

468 Participants in both samples completed a multi-section questionnaire that collected
469 the following information.

470 *Personal Details*

471 Data collected included; sex, date of birth, competition level, hours training per
472 week, and years participating in gymnastics.

473 *Self-Generated Strengths and Weaknesses*

474 Participants were asked to select a trait from a list of attributes deemed important for
475 successful gymnastic performance (e.g., persistent, confident, passionate, courageous,
476 determined, flexible, coordinated, strong, agile and powerful) that they were satisfied (e.g., a
477 strength) and dissatisfied with (e.g., a weakness).

478 *Implicit Theories*

479 Participants indicated their beliefs about the malleability of their self-generated
480 strength and weakness, either for self (sample 1) or other gymnasts (sample 2) using Dweck's
481 (1999) Implicit Theories of Intelligence for Children Scale. Three items were used to
482 measure implicit theories using a six-point Likert scale with the anchor points from strongly
483 disagree (1) to strongly agree (6). An example item is; 'How (chosen strength/weakness) I am
484 is something very basic about me and it cannot be changed very much'. Steimer and Mata
485 (2016) found the items had good validity and reliability scores with strength scores of .91 and
486 weakness scores of .88.

487 *Direction of Future Change and Desire for Change*

488 To measure direction of expected future change and desire for change we used the
489 same items from study 1 from Steimer and Mata (2016).

490 **Data Analysis**

491 As with study 1, data analysis was carried out using SPSS version 25. Data were
492 screened for outliers ($> 3.29SD$ above or below the mean), no outliers were identified in
493 either sample. Means, standard deviations and correlations were computed for all variables.

494 *Main Analyses*

495 We followed the same analysis procedures as study 1 to determine if the findings
496 from study 1 generalised to a specific youth sport activity. Follow-up mediation analyses
497 were conducted if appropriate based on the findings from the MANOVAs.

498 **Results**

499 **High Self-Relevance Gymnastics Sample: Motivation as an Antecedent**

500 *Descriptive Results*

501 Table 2 presents the means, standard deviations and correlations for all the variables
502 in both the gymnastics samples. All mean scores were above the scale mid-point. The mean
503 scores for implicit theory, desire for change and direction of future change were higher for
504 weaknesses than strengths. This suggests that gymnasts perceived greater stability in their
505 weaknesses than their strengths, and expected more future improvement and wanted to
506 change their weaknesses more so than their strengths

507 All strength variables had a small to moderate, positive correlation with the opposite
508 weakness variable, for example implicit entity theory for strength had a significant small,
509 positive association with implicit entity theory for weakness. Among the strength variables,
510 implicit theory had a small, positive correlation with desire for change, while among the
511 weakness variables implicit entity theory had a moderate, positive correlation with expected
512 direction of future change.

513 *Differences in Implicit Theories, Desire, and Direction of Change*

514 A one-way, within-person, repeated measures MANOVA tested whether motivation
515 was an antecedent of gymnasts perceptions of the malleability, desire for change, and
516 direction of future change of their strengths compared to their weaknesses. The MANOVA,
517 with trait desirability (strength vs. weakness) as the independent variable and implicit theory,
518 desire for change, and expected direction of future changes as the dependent variables,
519 revealed a significant multivariate effect for trait desirability ($F_{(3,56)} = 20.97, p < .001, \eta p^2 =$

520 Table 2. Means, standard deviations and correlations between all measured variables in the Gymnastics Samples.

521

522

<i>Gymnastics: High Self-Relevance</i>										523
Variable	M	SD	Range	1.	2.	3.	4.	5.		524
1. Implicit Entity Theory Strength	3.36	1.12	1-6	-						525
2. Desire Strength	4.72	1.31	1-7	.334**	-					526
3. Direction Strength	1.00	1.25	-3-3	-.165	.179	-				527
4. Implicit Entity Theory Weakness	4.11	1.08	1-6	.294*	.266**	.226	-			528
5. Desire Weakness	5.92	.91	1-7	-.108	.342**	.191	.020	-		529
6. Direction Weakness	1.22	1.08	-3-3	.109	.280*	.447**	.401**	.239		530
<i>Gymnastics: Low Self-Relevance</i>										533
Variable	M	SD	Range	1.	2.	3.	4.	5.		534
1. Implicit Entity Theory Strength	3.40	1.33	1-6	-						535
2. Desire Strength	4.84	1.18	1-7	-.019	-					536
3. Direction Strength	1.20	1.32	-3-3	-.126	.447**	-				537
4. Implicit Entity Theory Weakness	3.28	1.50	1-6	.441**	-.190	-.268**	-			538
5. Desire Weakness	5.13	.97	1-7	-.078	.752**	.314**	-.126	-		539
6. Direction Weakness	1.49	1.27	-3-3	-.150	.045	.449**	-.076	.136		540
										541
										542
										543
										544

545 Notes: ** $p \leq 0.01$; * $p \leq 0.05$.

546

547 .529). Specifically, there was a significant effect for both implicit entity theory ($F_{(1,58)} =$
548 19.41, $p < .001$, $\eta^2 = .251$, 95% CI_{diff} = [-1.09, -.41]) and desire for change ($F_{(1,58)} = 48.61$, p
549 $< .001$, $\eta^2 = .456$, 95% CI_{diff} = [-1.54, -.85]), but not for direction of future change ($F_{(1,58)} =$
550 1.89, $p = .175$, $\eta^2 = .03$, 95% CI_{diff} = [-.54, .10]). Gymnasts reported greater stability in
551 their own weaknesses ($M = 4.11$) than their strengths ($M = 3.36$), thus motivation was found
552 to be an antecedent of implicit theory endorsement. Gymnasts also reported a greater desire
553 for change in their own weaknesses ($M = 5.92$) than their own strengths ($M = 4.72$). No
554 mediation analyses were conducted due to incongruent findings for strengths and weaknesses
555 for implicit theory and desire for change.

556 **Low Self-Relevance Gymnastics Sample: Self-Enhancement as an Antecedent**

557 *Descriptive Results*

558 All mean scores were above the scale mid-point. The mean score for implicit theory was
559 higher for strengths than weaknesses but desire for change and direction of future change
560 were higher for weaknesses than strengths. This suggests that gymnasts perceived greater
561 stability in other gymnasts' strengths than their weaknesses but expected more future
562 improvement and a greater desire to change in other gymnasts' weaknesses than their
563 strengths.

564 All strength variables had moderate to large positive correlations with the opposite
565 weakness variable, for example implicit entity theory for strength had a significant moderate,
566 positive association with implicit entity theory for weakness. Within both the strength or
567 weakness variables separately, implicit entity theory was not associated with either desire to
568 change or direction of future change. For strengths only, there was a moderate positive
569 correlation between desire to change and direction of future change.

570 *Differences in Implicit Theories, Desire, and Direction of Change*

571 A one-way, within-person, repeated measures MANOVA tested whether motivation
572 was an antecedent of gymnasts perceptions of the malleability, desire for change, and
573 direction of future change of other gymnasts' strengths compared to their weaknesses. The
574 MANOVA, with trait desirability (strength vs. weakness) as the independent variable and
575 implicit theory, desire for change, and expected direction of future change as the dependent
576 variables, revealed a significant multivariate effect for trait desirability on the dependent
577 variables ($F_{(3,93)} = 5.33, p = .002, \eta^2 = .147$). Specifically, there was a significant effect for
578 desire for change ($F_{(1,95)} = 12.93, p < .001, \eta^2 = .120, 95\% \text{ CI}_{\text{diff}} = [-.45, -.13]$) and direction
579 of future change ($F_{(1,95)} = 4.41, p = .038, \eta^2 = .044, 95\% \text{ CI}_{\text{diff}} = [-.57, -.02]$), but not for
580 implicit entity theory ($F_{(1,95)} = 0.63, p = .429, \eta^2 = .007, 95\% \text{ CI}_{\text{diff}} = [-.18, .43]$). Gymnasts
581 reported no difference in their implicit entity theory for the strengths ($M = 3.40$) and the
582 weaknesses ($M = 3.28$) of other gymnasts of the same age, thus there was no evidence of
583 motivation as an antecedent of implicit theory endorsement. However, they did report a
584 greater desire for change in the weaknesses ($M = 5.13$) than the strengths ($M = 4.84$) of other
585 gymnasts and expected greater future improvement in other gymnasts weaknesses ($M = 1.49$)
586 than their strengths ($M = 1.20$). As no differences in implicit entity theory were found, no
587 further mediation analyses were completed.

588 **Brief Discussion**

589 Study 2 provides further evidence for motivation as an antecedent of implicit theory
590 endorsement with gymnasts holding different implicit theories for their own strengths and
591 weaknesses. These findings were consistent with those in study 1 as gymnasts perceived their
592 strengths as more malleable than their weaknesses. However, counter to the findings of study
593 1, gymnasts reported a greater desire to change their weaknesses than their strengths. In study
594 2 we found that the differences in implicit theories for other gymnasts' strengths and

595 weaknesses, disappeared. Study 2, therefore, provides initial evidence for a self-enhancement
596 effect on implicit theory endorsement within a specific competitive youth sport activity.

597 **General Discussion**

598 The current study explored motivation, and specifically the motivation to see oneself
599 in a positive light, as an antecedent of implicit theory endorsement in two significant physical
600 contexts – one a compulsory school context for all young people, the other a voluntary
601 leisure-time, competitive setting. Implicit theories have been consistently identified as
602 important motivational constructs in a variety of domains (Dweck & Molden, 2017), yet the
603 identification of factors that influence the endorsement of different implicit theories remains
604 largely understudied. Our study addresses this important issue and provides the first insight
605 into what factors may influence young people’s beliefs about their attributes. Across two
606 studies, we found evidence for a motivational and a self-enhancement influence on implicit
607 theory endorsement. Our findings extend the existing implicit theory and motivated reasoning
608 literatures by (1) identifying motivation, and specifically motivation to see oneself in a
609 positive light, as potentially shaping implicit theory endorsement in two different youth sport
610 contexts, (2), demonstrating that implicit theories are themselves malleable for young people
611 and not only for adults, and (3) broadening the evidence for the use of motivated implicit
612 theories as a self-enhancement strategy to a new population and context.

613 At both the domain- and activity-specific level we found evidence for motivation as
614 an antecedent of implicit theory endorsement with students and gymnasts holding different
615 implicit theories for their strengths and weaknesses. Young people perceived attributes
616 considered to be a strength as more malleable than those that they considered to be a
617 weakness, irrespective of whether this was in PE or in gymnastics. This motivational effect
618 was evident even when different measures of implicit theories were used. We also found that
619 young people shaped their implicit theories in the service of self-enhancement. Consistent

620 with previous evidence on adults' implicit theory endorsement (Leith et al., 2014; Steimer &
621 Mata, 2016), differences in implicit theory endorsement for strengths and weaknesses
622 disappeared in the low self-relevance condition in both studies. Our findings, therefore, attest
623 to the relevance of motivated implicit theories in a new domain and with a younger
624 population

625 In the high self-relevance condition, the data in both studies were counter to the
626 existing literature on adults' personality characteristics (Steimer & Mata, 2016). This is
627 perhaps not entirely unexpected given the different developmental stage of the participants in
628 the research studies and the type of competence-relevant personal attribute that was the focus
629 of attention. Our findings suggest an interesting motivational perspective for young people in
630 sport settings, especially when combined with other constructs such as the desire for change
631 of strengths and weaknesses and the expected direction of future change.

632 Young people's view that strengths are more malleable than their weaknesses ('my
633 strengths will not go away, they will only get better'), suggests a potentially adaptive and
634 self-advancing motivational perspective of personal attributes. In both studies, although there
635 was no difference between strengths and weaknesses for the direction of expected future
636 change, students and gymnasts both reported that they expected future improvement in their
637 strengths with scores above the scale mid-point. The malleability of their strengths, coupled
638 with the positive direction of expected change, suggest that young people are optimistic about
639 the continued development of their strengths, in that they will improve rather than decline or
640 remain stable. This optimism enables the individual to protect their beliefs about both their
641 current and future selves and to develop a positive sense of self (Sedikides & Alicke, 2018).
642 In the PE sample, this positive motivational perspective is further enhanced through students
643 having a stronger desire to change their strengths rather than their weaknesses. Consistent
644 with theoretical and empirical evidence regarding the positive outcomes associated with the

645 view of attributes as malleable (Dweck & Molden, 2017), students may therefore be more
646 likely to invest time and effort in improving their strengths and thus consolidate their positive
647 sense of self. Moreover, this view is arguably developmentally appropriate, as young people
648 have time and opportunity to develop further and it would be pessimistic to consider that the
649 strengths of an individual were fully established before the age of 16. Nevertheless, it would
650 be interesting to examine change in the perceived malleability of strengths over time as
651 young performers and students age, encounter puberty, and experience injuries that could
652 potentially impact on perceptions of strengths relative to weaknesses.

653 On the other hand, our results suggest that this positive motivational perspective may
654 be offset by young people's view that their weaknesses are more stable than their strengths
655 ('my weaknesses are here to stay'). This potentially problematic motivational perspective
656 was evident in both studies but may be exacerbated in the PE setting where this view was
657 accompanied by a lower desire to change their weaknesses than their strengths. It is well
658 established across a variety of domains that a view of attributes as stable is associated with a
659 meaning system that makes individuals susceptible to experiencing negative outcomes
660 (Dweck & Molden, 2017). Consequently, this view of their weaknesses may deter students
661 from investing effort in order to improve them (Hong, Chiu, Dweck, Lin & Wan, 1999). As a
662 result, their weaknesses will stagnate, increasing the likelihood for a negative experience of
663 PE given the weaknesses may be exposed by one or more of the activities taught as part of a
664 broad PE curriculum. Such experiences may have long-lasting and negative effects on young
665 people's motivation and participation in sport and physical activity settings both within and
666 beyond the school setting. It is therefore important that teachers, coaches and parents not only
667 encourage the development of malleability beliefs about personal attributes, but also support
668 students to value developing their weaknesses to create a strong desire to improve them.

669 Interestingly, the problematic motivational perspective may be lessened in
670 competitive youth sport settings as gymnasts reported a greater desire to change their
671 weaknesses than their strengths. It is possible that this greater desire to change a weakness
672 may override the expected effects of the implicit theory and encourage the gymnast to invest
673 effort in improving their weakness. The greater desire for change may work as a self-
674 protective motive to enable the gymnasts to minimise the effects of their less malleable view
675 of their weaknesses on their current and future training practices (Sedikides & Alicke, 2018).
676 The contextual differences in desire to change observed in the present research may be
677 reflective of the educational versus competitive focus of the two contexts. The need for
678 gymnasts to address their weaknesses in order to be successful may be stronger than for
679 students in the educational PE setting where the consequences of weaknesses may be less
680 important. Consequently, the self-protective motive of desire for change is energised in
681 gymnasts in response to these situational demands and the potential threat of the weakness to
682 the individual's level of performance (Sedikides & Alicke, 2018).

683 Despite being able to establish a motivational effect on desire for change in both
684 studies, we did not find that that desire for change was the motivational mechanism (the
685 mediator) by which trait desirability (strength or weakness) influenced implicit theory
686 endorsement. This is contrary to the only previous research in this area on adults' personality
687 characteristics (Steimer & Mata, 2016) and underscores the need for further research to
688 address the mediating role of desire for change in the physical domain. Given self-
689 enhancement tends to occur in domains that matter most to individuals (Crocker, 2002;
690 Sedikides, Gaertner, & Toguchi, 2003), future research may also wish to explore other
691 motivational mechanisms, such as relationship quality, motivational climate, fear of failure or
692 the value placed on the particular attribute or context of interest, to understand why and how
693 the motivational effects on implicit theories are present.

694 Limitations, Future Directions, and Conclusion

695 Our findings make an important contribution to both the motivation and motivated
696 reasoning literatures by offering an insight into a fundamental but understudied issue - the
697 antecedents of implicit theories. However, further research, which will address the limitations
698 of the current studies, is needed to corroborate and extend these initial findings into the
699 motivational underpinnings of implicit theories. The inclusion of value of the domain or
700 activity to the individual will help to elucidate differences in the findings with respect to
701 malleability and desire for change in strengths and weaknesses. One might assume that a
702 gymnast would value gymnastics in a youth sport setting in which they have chosen to
703 participate, more so than a student in a compulsory PE setting might value PE. However, we
704 also know that many children may participate in voluntary sports settings for controlled
705 reasons and therefore the interplay of value in motivated implicit theories is of interest for
706 future research. In addition, work should seek to replicate our findings at the domain level
707 (i.e., in sport and PE generally), as well as for different youth sports in order to more fully
708 explore the consequences of motivated implicit theories for young people. Future research
709 should also address the theoretical proposition that differences in implicit theory endorsement
710 will be most likely when individuals are experiencing challenges and difficulties (Dweck,
711 1999). For example, do young people use motivated implicit theories as a self-enhancement
712 strategy prior to a challenge or difficulty, or does a setback encourage and promote the use of
713 such strategies?

714 Finally, in light of the extensive research interest on implicit theories, it would appear
715 that the questions surrounding motivated implicit theories are of importance to other life
716 domains (e.g., education, personality, morality, social perception) where they have been
717 established as important motivational constructs. Of notable interest may be the educational
718 domain in which theory and research originated and for where there is a wealth of evidence

719 linking implicit theories to learning processes and educational outcomes (e.g., Yeager et al.,
720 2016, 2019). We know that young people's implicit theories of intelligence are shaped by
721 external factors such as person and process praise from adults (Cimpian et al., 2007;
722 Pomerantz & Kempner, 2013) and their responses to young people's failures (Haimovitz &
723 Dweck, 2016), however, are they also influenced by internal antecedents such as motivation,
724 and the motivation to see oneself in a positive light? We propose that exploring both
725 intrapersonal and contextual antecedents in combination will help to elucidate both the
726 unique and combined effects on implicit theory endorsement. For example, does the type of
727 praise received have more effect on implicit theory endorsement when the individual is
728 concerned with self-advancement or self-protection as a self-enhancement strategy? In short,
729 there is much to learn from future work that illuminates the aetiology of these important
730 motivational constructs and their role in motivation, personality, and development in young
731 people more broadly.

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