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The relationship between implicit beliefs, anxiety, and attributional style in high-level soccer players

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Abstract

This study investigated whether attributional style mediated the relationship between implicit beliefs and competition anxiety. Seventy-two soccer players completed the Conceptions of the Nature of Athletic Ability Questionnaire-Version 2, Sports Competition Anxiety Test, and short form Sports Attributional Style Scale. Entity beliefs were associated with heightened anxiety. Incremental beliefs were associated with lowered anxiety. Uncontrollable and global attributions mediated the relationship between entity beliefs and anxiety. Controllable and specific attributions mediated the relationship between incremental beliefs and anxiety. The social-cognitive model of achievement motivation appears to apply to the sporting domain and may facilitate anxiety and attribution research.

Keywords

beliefs, anxiety, soccer, attributional, players, style, high, level, relationship, between, implicit

Disciplines

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12 and the short form Sports Attributional Style Scale. Entity beliefs were associated with
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19 Keywords: Implicit theory; Entity beliefs; Incremental beliefs; Social-cognitive model of
20 achievement motivation; Competition anxiety

21 The Relationship Between Implicit Theories, Anxiety, and Attributional Style in High Level
22 Soccer Players

23 For both elite and non-elite athletes, certain levels of competition anxiety are
24 considered normal and even have the potential to positively influence performance (Hanton,
25 O'Brien, & Mellalieu, 2003). However, excessive levels of competition anxiety are highly
26 prevalent among athletes, resulting in adverse consequences such as impaired performance,
27 reduced enjoyment and pleasure, and discontinued participation (Lazarus, 2000; Scanlan,
28 Babkes, & Scanlan, 2005; Smith & Smoll, 1991). Clarification of the nature and influence of
29 competition anxiety, therefore, has important implications for athletes' performance and
30 psychological well-being.

31 **Competition Anxiety**

32 Competition anxiety refers to the aversive emotional response associated with
33 perceiving a competitive situation as potentially threatening (Englert & Bertrams, 2012).
34 There has long been recognition of the need to understand the antecedents of competition
35 anxiety and improve conceptual clarity in this context (e.g., Gould, Petlichkoff, & Weinberg,
36 1984). It is argued that research must move beyond mere descriptions of anxiety by utilizing
37 a strong theoretical framework to examine the underlying processes that are fundamental to
38 perceiving the situation as threatening, and consequently resulting in the aversive emotional
39 response (Hall & Kerr, 1998; Woodman & Hardy, 2003). A number of theories and models
40 have been proposed to explore competition anxiety such as multidimensional anxiety theory
41 (Martens, Vealey, & Burton, 1990), reversal theory (Apter, 1982), and catastrophe models
42 (Hardy, 1990). More recently, appraisal theories such as Lazarus' (1991) cognitive
43 motivational relational theory have been applied to sport which highlight the role that
44 cognitions play in generating emotional responses. It is proposed that it is the evaluation of
45 the situation (i.e., the appraisals) that leads to the anxiety response (Lazarus, 2000). In other

46 domains, such as intelligence (Ruiselová & Prokopčáková, 2005) and physical activity
47 (Ommundsen, 2001), Dweck and Leggett's (1988) social cognitive model of achievement
48 motivation has also demonstrated potential as a useful framework to investigate anxiety.
49 Similar to the role of appraisals in the cognitive motivational relational theory, Dweck and
50 Leggett's (1988) concept of implicit beliefs are viewed as the core cognitive processes
51 leading to the anxiety response. The current research aims to apply the social cognitive model
52 of achievement motivation to the sports domain and utilize it as the theoretical framework to
53 understand competition anxiety.

54 **Social-Cognitive Model of Achievement Motivation**

55 Dweck and Leggett's (1988) social-cognitive model of achievement motivation
56 proposes that individual differences in implicit beliefs about the nature of ability lead to
57 differences in cognitive, affective, and behavioral responses within achievement settings.
58 These differences could have implications for competition anxiety, but this has not been
59 widely investigated. The model proposes two main types of implicit beliefs (known as entity
60 and incremental beliefs), which are also referred to as implicit theories. Individuals endorsing
61 entity beliefs view ability as a fixed, uncontrollable, and stable trait, whereas those endorsing
62 incremental beliefs view ability as malleable, controllable, and increasable through learning.
63 Entity beliefs have been linked with maladaptive cognitive, behavioral, and affective
64 outcomes, such as decreased motivation and withdrawal from tasks. Conversely, incremental
65 beliefs are associated with more positive outcomes, such as higher motivation, task
66 persistence, and lower anxiety (Dweck, Chiu, & Hong, 1995a; Tamir, John, Srivastava, &
67 Gross, 2007).

68 The social-cognitive model of achievement motivation emanated from earlier work on
69 achievement goal orientations, and it is suggested that an individual's implicit beliefs about
70 ability orient them to favor either a performance goal or a learning goal (Dweck & Leggett,

71 1988; Elliott & Dweck, 1988). Studies have found that individuals endorsing entity beliefs
72 tend to adhere to performance goals and those high in incremental beliefs tend to favor
73 learning goals (Dweck, Chiu, & Hong, 1995b; Dweck & Leggett, 1988; Ommundsen, 2001).
74 However, equivocal results surrounding achievement goals in the model have led to less of a
75 focus on goals as a mediating construct, and it is argued that implicit theories themselves
76 create a framework that fosters responses congruent with that framework (Cury, Elliot, Da
77 Fonseca, & Moller, 2006; Dweck et al., 1995a; Harackiewicz & Elliot, 1995). As such, the
78 current study focuses on the direct relationship between implicit beliefs and outcomes in
79 achievement settings.

80 It is feasible that individual differences in entity and incremental beliefs could have
81 implications for competition anxiety (Biddle, 1999; Dweck & Leggett, 1988). Thus,
82 utilization of the social-cognitive model of achievement motivation could provide useful
83 insights into the cognitive processes underlying anxiety in sport (Hall, Kerr, & Matthews,
84 1998; Ommundsen, 2001). Ommundsen (2001) examined this model in physical education
85 classes and found that a fixed conception of ability, or entity theory, was associated with
86 heightened trait anxiety. However, the relationships between implicit beliefs and affective
87 responses, specifically trait anxiety levels, have not yet been explored within a competitive
88 sport environment. Furthermore, although incremental beliefs have previously been linked
89 with increased positive affect, future research may benefit from investigating whether
90 endorsing incremental beliefs can also lower negative affect, such as anxiety (Ommundsen,
91 2001; Robins & Pals, 2002).

92 **The Role of Attributional Style**

93 Although there is a need to further investigate whether implicit beliefs are associated
94 with competition anxiety, it is also important to understand how these variables are related.
95 One possibility is that these associations are mediated by an individual's attributional style,

96 which refers to the way individuals typically explain the causes of positive and negative
97 events (Le Foll, Rascle, & Higgins, 2006). Mediation refers to a situation whereby an
98 independent variable affects a dependent variable by influencing intervening variables known
99 as the mediators (Hayes, 2009). In the present context, the social-cognitive perspective
100 proposes that an individual's underlying implicit beliefs affect their interpretation and
101 explanation of events (i.e., attributional style), which in turn influences their emotional
102 response (Dweck et al., 1995a; Dweck & Leggett, 1988). This suggests that attributional style
103 could be an important variable linking implicit belief systems with emotional responses. In
104 other words, attributional style could mediate the relationship between implicit beliefs and
105 emotions, such as anxiety. The social-cognitive approach also proposes that any factor can be
106 interpreted as controllable or uncontrollable, whereas the classic attributional approach
107 construes factors as inherently controllable or uncontrollable (Dweck & Leggett, 1988).

108 Attributional style consists of five major dimensions: (a) Internality, which is the
109 extent to which the individual perceives the cause of the event to be internal or external to
110 them; (b) Stability, which is whether the individual perceives the cause as stable or
111 changeable over time; (c) Globality, which refers to whether the cause influences only a
112 specific situation or many situations; (d) Controllability, which refers to the degree to which
113 the cause is perceived to be within the individual's control or beyond it; and, (e)
114 Intentionality, which refers to whether the cause was deliberate or not (Hanrahan & Grove,
115 1990). As Intentionality has been found to overlap with Controllability and/or Internality it
116 has been excluded from many studies (Hanrahan & Grove, 1990; Kelley & Michela, 1980;
117 Russell, 1982), and thus it is also excluded in this paper.

118 According to the social-cognitive model of achievement motivation framework,
119 attributional styles could provide an important link between underlying belief systems and
120 anxiety (Dweck & Leggett, 1988). As individuals endorsing implicit entity or incremental

121 beliefs portray factors within themselves and the world as inherently fixed or malleable, they
122 are therefore more likely to see this reflected in outcomes and subsequently explain events in
123 these terms (Dweck & Leggett, 1988; Hong, Chiu, Lin, Wan, & Dweck, 1999). This link has
124 been supported by Miserandino (1998) who found that basketball players trained to attribute
125 performance to effort had more mastery-oriented responses and improved performance.
126 However, Dweck et al. (1995) noted that the relationship between implicit theories and
127 attributional style has not yet been formally established and thus there is a need for future
128 research to explore this link.

129 Most existing research has focused on the influence of optimistic and pessimistic
130 attributional styles on performance (Abramson, Seligman, & Teasdale, 1978; Peterson, 1991;
131 Seligman, 1990). A pessimistic attributional style involves explaining negative events as due
132 to internal, stable, and global causes, and positive events as due to external, unstable, and
133 specific causes (Martin-Krumm, Sarrazin, & Peterson, 2005). Conversely, an optimistic
134 attributional style consists of external, unstable, and specific attributions to negative events,
135 and internal, stable, and global attributions to positive events (Parkes & Mallett, 2011).
136 Although some studies have linked poorer performance to a pessimistic attributional style and
137 improved performance and persistence to an optimistic attributional style, there has been
138 some uncertainty around these findings (Gordon, 2008; Kerr & Beh, 1995; Le Foll et al.,
139 2006; Miserandino, 1998).

140 Approaching sports attributional studies using the social-cognitive model of
141 achievement motivation, rather than traditional attribution theory, may enable researchers to
142 clarify previously equivocal findings. For example, classing individuals as holding either
143 optimistic or pessimistic attributional styles means they must produce strictly opposite
144 attributions in success and failure situations. However, if viewed in the context of the social-
145 cognitive model of achievement motivation, it becomes apparent that this is not always the

146 case. Although an entity theorist is likely to make internal attributions to failure as they
147 believe in fixed ability, an incremental theorist will not necessarily make external
148 attributions. Endorsing incremental beliefs involves a focus on effort which, like ability, is
149 also internal to the individual (Robins & Pals, 2002). Furthermore, the controllability
150 dimension is omitted from the pessimistic and optimistic attributional styles, although it is a
151 central element within the social-cognitive model of achievement motivation. Viewing ability
152 as inherently fixed within entity beliefs would therefore lead the individual to interpret it as
153 an uncontrollable factor. In contrast, individuals endorsing incremental beliefs view ability as
154 increasable through effort and thus controllable (Dweck & Leggett, 1988).

155 Attributional style has important implications for competition anxiety and could
156 inform strategies to improve athletic performance, future motivation, and well-being (Allen,
157 Jones, & Sheffield, 2009; Miserandino, 1998). For instance, previous research has linked the
158 tendency to explain negative events as internal, stable, and global (i.e., a pessimistic
159 attributional style) with heightened anxiety levels in both sporting and nonsporting
160 environments. In contrast, attributing negative events to external, unstable, and specific
161 causes (i.e., an optimistic attributional style) is associated with decreased anxiety levels
162 (Ahrens & Haaga, 1993; Martin-Krumm, Sarrazin, Peterson, & Famose, 2003; Sanjuán,
163 Pérez, Rueda, & Ruiz, 2008). Other research has emphasized the importance of
164 controllability attributions and has linked less perceived control with heightened anxiety
165 levels, and greater perceived control with lowered anxiety levels (Hanton et al., 2003). Given
166 that attributional style is proposed to arise from one's more basic implicit belief systems,
167 there is a need to investigate the link with competition anxiety levels in the context of implicit
168 entity and incremental beliefs. Utilizing the social-cognitive model of achievement
169 motivation as a theoretical framework may enable researchers to identify and regulate the
170 antecedents of competition anxiety.

171 **The Present Study**

172 The objective of the current study was to investigate the nature of the relationship
173 between implicit beliefs and competition anxiety. Specifically, the current research aims to
174 understand how implicit belief systems are associated with the interpretation and explanation
175 of events, and subsequent emotional responses in sports achievement settings. Consistent
176 with existing research, it was hypothesized that: Athletes endorsing higher entity beliefs will
177 report higher levels of competition anxiety, and athletes endorsing higher incremental beliefs
178 will report lower levels of competition anxiety.

179 As outlined above, the social-cognitive model of achievement motivation suggests
180 that attributional style could be an important mechanism by which implicit beliefs influence
181 emotional responses. Therefore, in this study, it was expected that attributional style would
182 mediate the relationship between implicit beliefs and competition anxiety. This involved
183 testing three additional hypotheses: Athletes endorsing higher entity beliefs will tend to
184 attribute positive events to more uncontrollable, external, specific, and unstable factors and
185 negative events to more uncontrollable, internal, global, and stable factors; athletes endorsing
186 higher incremental beliefs will tend to attribute positive events to more controllable, internal,
187 global, and stable factors and negative events to more controllable, internal, specific, and
188 unstable factors; and, the association between implicit beliefs (entity and incremental beliefs)
189 and sports competition anxiety will be mediated by attributional style for negative events.

190 **Methods**

191 **Participants**

192 Participants comprised 72 soccer players (42 males, 30 females) between 17 and 44
193 years of age ($M = 24.31$, $SD = 5.22$) from high level amateur and semi-professional teams in
194 the Illawarra and Southern Sydney region of New South Wales. The sample consisted of
195 36.1% ($n = 26$) of participants from the Men's Semi-Professional League, 27.8% ($n = 20$)

196 from the Women's Semi-Professional League, 22.2% ($n = 16$) from the Men's Amateur
197 League, and 13.9% ($n = 10$) from the Women's Amateur League. Of the 72 participants,
198 77.8% ($n = 56$) described their ethnic background as Australian, 18.1% ($n = 13$) as European,
199 1.4% ($n = 1$) as Middle Eastern, 1.4% ($n = 1$) as Asian, and 1.4% ($n = 1$) as other.
200 Participant's number of years of experience playing soccer ranged from 4 to 33 ($M = 15.58$,
201 $SD = 6.29$) and their hours spent training each week ranged from 1 to 15 ($M = 4.98$, $SD =$
202 3.28).

203 **Procedure**

204 Approval for the study was received via the Institutional Research Ethics Committee.
205 Coaches were contacted and informed about the study. If they gave consent for the
206 researchers to approach their team, they were asked to set aside 15 minutes at the beginning
207 of a training session. During this time, a verbal description of the study was given to potential
208 participants as well as participant information sheets and consent forms. Participants were
209 advised that if they chose not to participate in the study it would not affect their relationship
210 with their club, coach, or the university. If the participants chose to partake in the study they
211 were asked to complete the consent form and an anonymous questionnaire booklet.

212 **Measures**

213 **Implicit Beliefs.** The Conceptions of the Nature of Athletic Ability Questionnaire-
214 Version 2 (CNAAQ-2; Biddle, Wang, Chatzisarantis, & Spray, 2003) assessed implicit
215 incremental and entity beliefs. The questionnaire consists of 12 items assessing four
216 subscales of beliefs about athletic ability (three items for each subscale). The Learning
217 subscale (e.g., 'You need to learn and to work hard to be good at sport') and the Improvement
218 subscale (e.g., 'In sport, if you work hard at it, you will always get better') are summed to
219 assess Incremental beliefs. The Gift subscale (e.g., 'To be good at sport you need to be
220 naturally gifted') and the Stable subscale (e.g., 'It is difficult to change how good you are in

221 sport') are summed to assess Entity beliefs. For each item, participants were asked to respond
222 on a five-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). This scale has
223 been shown to produce valid and reliable estimates of entity and incremental beliefs (Biddle
224 et al., 2003) with satisfactory internal consistency within adult populations (Blackwell,
225 Trzesniewski, & Dweck, 2007; Wang & Koh, 2006). Cronbach's alpha in the current study
226 was $\alpha = .87$ (entity beliefs), $\alpha = .83$ (incremental beliefs).

227 **Competition Anxiety.** The Sports Competition Anxiety Test (SCAT; Martens et al.,
228 1990) was used to assess competitive trait anxiety. The questionnaire consists of 15 items, 10
229 of which assess cognitive and somatic components of anxiety (e.g., 'Before I compete I
230 worry about not performing well' and 'Before I compete I get a queasy feeling in my
231 stomach') and five of which are used to reduce the likelihood of an internal response-set bias
232 and are not included in the scoring (e.g., 'Competing against others is socially enjoyable').
233 For each item, participants were instructed to respond on a three-point scale (1 = *rarely*, 2 =
234 *sometimes*, 3 = *often*) indicating how often they generally experience the anxiety symptom.
235 The scores for the 10 items assessing anxiety were summed, with higher scores representing
236 greater levels of trait competition anxiety. The instrument has been widely used and has been
237 shown to produce valid and reliable estimates of trait sports anxiety (Martens et al., 1990). In
238 the present study the Cronbach's alpha coefficient was acceptable at $\alpha = .88$.

239 **Attributional Style.** Adapted from the Sports Attributional Style Scale (Hanrahan,
240 Grove, & Hattie, 1989) the short form Sports Attributional Style Scale (Hanrahan & Grove,
241 1990) was used to measure sports-related attributional style. The scale consists of five
242 positive (e.g., 'You perform very well in a competition') and five negative (e.g., 'The coach
243 criticizes your performance') hypothetical sporting situations that are matched for content.
244 Participants were instructed to imagine themselves in the situation and record the single most
245 likely cause of that event happening to them. Respondents rated the cause along a seven-point

246 scale for each of the attributional dimensions (*Internal/External, Stable/Unstable,*
247 *Global/Specific, Controllable/Uncontrollable*). Due to debate over Intentionality confounding
248 with other dimensions and for the purpose of this study, only the Internality, Stability,
249 Globality and Controllability dimensions were deemed relevant and were subsequently used
250 (Hanrahan & Grove, 1990; Kelley & Michela, 1980; Russell, 1982). The Cronbach's alpha
251 coefficients for the four subscales in the current study ranged from .81 to .91 for both positive
252 and negative events.

253 **Statistical Analysis**

254 The data were analyzed using SPSS version 19.0. Pearson correlations assessed the
255 bivariate relationships between measures of implicit beliefs (entity and incremental),
256 competition anxiety levels, and the four dimensions of attributional style to both positive and
257 negative events (internal/external, stable/unstable, global/specific,
258 controllable/uncontrollable). A multiple mediation model was then tested using the procedure
259 developed by Preacher and Hayes (2004) to examine whether entity and incremental beliefs
260 were indirectly associated with competition anxiety levels through the dimensions of
261 attributional style to positive and negative events. This method has greater effectiveness on
262 smaller sample sizes than previous approaches to testing mediation (Hayes, 2009). Participant
263 sex, age, ethnic background, and current level of competition were included as covariates.
264 The pathways were quantified using unstandardized beta coefficients with statistical
265 significance determined by $p < .05$. The significance of indirect effects was determined from
266 95% confidence intervals calculated using a bootstrapping procedure with 5000 resamples.

267 **Results**

268 **Correlations**

269 The correlations between implicit beliefs, competition anxiety, and the dimensions of
270 attributional style for positive and negative events are illustrated in Table 1.

271 **Mediation**272 **Incremental beliefs and anxiety through attributional style for positive events.**

273 The multiple mediation model linking incremental beliefs with competition anxiety through
274 the dimensions of attributional style for positive events found that incremental beliefs were
275 positively associated with Internality, $\beta = .85, p < .001$; Stability, $\beta = .88, p < .001$;
276 Globality, $\beta = 1.07, p < .001$; and Controllability, $\beta = 1.28, p < .001$. However, the
277 Internality, Stability, Globality, and Controllability dimensions were not significantly related
278 to competition anxiety. The total effect (*c* path) of incremental beliefs on competition anxiety
279 was significant, $\beta = -.55, p < .001$. However, the association between incremental beliefs and
280 competition anxiety attenuated and was not significant when attributional style for positive
281 events (*c'* path) was included in the model, $\beta = -.24, p = .244$.

282 The bootstrap test of indirect effects linking incremental beliefs with competition
283 anxiety through Internality, $\beta = .07, 95\% \text{ CI } [-.28, .45]$; Stability $\beta = .10 [-.20, .46]$;
284 Globality, $\beta = -.12 [-.53, .09]$; and Controllability, $\beta = -.36, [-.93, .07]$; for positive events
285 were not significant.

286 **Incremental beliefs and anxiety through attributional style for negative events.**

287 The multiple mediation model linking incremental beliefs with competition anxiety levels
288 through the dimensions of attributional style for negative events found incremental beliefs to
289 be negatively related to Globality, $\beta = -.56, p = .021$, and positively related to
290 controllability, $\beta = 1.36, p < .001$. Globality, $\beta = .23, p = .021$, and Controllability, $\beta = -.24, p$
291 $= .027$, were also significantly related to competition anxiety levels. The total effect (*c* path)
292 of incremental beliefs on anxiety was significant, $\beta = -.55, p < .001$. However, the association
293 between incremental beliefs and competition anxiety attenuated and was not significant when
294 attributional style for negative events (*c'* path) was included in the model, $\beta = -.14, p = .489$.

295 The bootstrap tests of the indirect effects linking incremental beliefs with competition
296 anxiety indicated that for negative events, Internality, $\beta = .033$, $[-.01, .16]$, and Stability, $\beta = -$
297 $.02$ $[-.04, .18]$, were not significant. However, the indirect effect linking incremental beliefs
298 with competition anxiety levels for negative events through Globality, $\beta = -.14$ $[-.36, -.01]$,
299 and Controllability, $\beta = -.32$ $[-.75, -.03]$, was significant. This suggests that controllable and
300 specific attributions partially mediated the inverse relationship between incremental beliefs
301 and competition anxiety levels for negative events.

302 **Entity beliefs and anxiety through attributional style for positive events.** The
303 multiple mediation model linking entity beliefs with competition anxiety levels through the
304 dimensions of attributional style for positive events found that entity beliefs were inversely
305 associated with Internality, $\beta = -.54$, $p < .001$; Stability, $\beta = -.53$, $p < .001$; Globality, $\beta = -$
306 $.88$, $p < .001$; and Controllability, $\beta = -.82$, $p < .001$. However, the Internality, Stability,
307 Globality, and Controllability dimensions were not significantly related to competition
308 anxiety. The total effect (c path) of entity beliefs on competition anxiety was significant, $\beta =$
309 $.41$, $p < .001$. The association between entity beliefs and competition anxiety attenuated and
310 was not significant when attributional style for positive events (c' path) was included in the
311 model, $\beta = .18$, $p = .192$.

312 Indirect bootstrap effects linking entity beliefs with competition anxiety for positive
313 events indicated that the Internality, $\beta = -.05$, $[-.29, .17]$; Stability, $\beta = -.05$ $[-.25, .15]$; and
314 Globality, $\beta = .07$ $[-.14, .35]$; dimensions were not significant. However, the indirect effect
315 linking entity beliefs with competition anxiety levels for positive events through
316 Controllability was significant, $\beta = .26$ $[.01, .57]$. This suggests that uncontrollable
317 attributions partially mediated the positive relationship between entity beliefs and
318 competition anxiety levels for positive events.

319 **Entity beliefs and anxiety through attributional style for negative events.** The
320 multiple mediation model linking entity beliefs with competition anxiety levels through the
321 dimensions of attributional style for negative events found entity beliefs to be positively
322 associated with Stability, $\beta = .35, p = .030$; and Globality, $\beta = .48, p = .006$; and inversely
323 associated with Controllability, $\beta = -.81, p < .001$. Globality, $\beta = .23, p = .021$, and
324 Controllability, $\beta = -.24, p = .012$, were also significantly related to competition anxiety
325 levels. The total effect (*c* path) of entity beliefs on competition anxiety was significant, $\beta =$
326 $.41, p < .001$. The association between entity beliefs and competition anxiety attenuated and
327 was not significant when negative events (*c'* path) was included in the model, $\beta = .13, p =$
328 $.329$.

329 The bootstrap tests of the indirect effects linking entity beliefs with competition
330 anxiety following negative events indicated that Internality, $\beta = .01, [-.05, .04]$, and
331 Stability, $\beta = -.03 [-.17, .06]$, were not significant. However, the indirect effect linking entity
332 beliefs with competition anxiety levels for negative events through Globality, $\beta = .12 [.01,$
333 $.29]$, and Controllability, $\beta = .20 [.04, .40]$, was significant. This suggests that uncontrollable
334 and global attributions partially mediated the positive relationship between entity beliefs and
335 competition anxiety levels for negative events.

336 **Discussion**

337 The present study indicated significant associations between implicit beliefs,
338 attributional style, and competition anxiety. Consistent with our hypotheses, entity beliefs
339 were associated with higher levels of competition anxiety. This compliments research in
340 other areas such as the intelligence domain (Ruiselová & Prokopčáková, 2005) and the
341 physical activity domain (Ommundsen, 2001). In regards to incremental beliefs, previous
342 research has tended to focus on the relationship with heightened positive affect, rather than
343 lowered negative affect, such as anxiety (Ommundsen, 2001). The finding that incremental

344 beliefs were associated with lower levels of competition anxiety could be valuable to anxiety
345 researchers as they may focus on making incremental beliefs more salient among athletes.
346 For example, Vella, Cliff, Okely, Weintraub, and Robinson (2014) proposed that coaching
347 behaviors and instructional strategies can be used to facilitate incremental beliefs. These
348 include focusing on effort and persistence, facilitating challenge, promoting the value of
349 failure, defining success as effort, the promotion of learning, and providing high expectations.

350 Higher entity beliefs were associated with uncontrollable, external, specific, and
351 unstable attributions for positive events and uncontrollable, global, and stable attributions for
352 negative events. These findings are consistent with previous research suggesting that
353 attributional style arises from one's more basic implicit beliefs (Dweck & Leggett, 1988;
354 Hong et al., 1999). The association between entity beliefs and uncontrollable attributions
355 challenges previous sports attribution research that omits the controllability dimension when
356 focusing on optimistic and pessimistic attributional styles (Martin-Krumm et al., 2003;
357 Peterson, 1991; Seligman, 1990). The central role of perceived control in the social-cognitive
358 model of achievement motivation, particularly in regards to anxiety, is a fundamental
359 difference between the social-cognitive perspective and the classic optimistic and pessimistic
360 attributional style approach (Dweck & Leggett, 1988; Peterson, 1991). However, entity
361 beliefs were not associated with more internal attributions for negative events. Although
362 inconsistent with previous research surrounding implicit beliefs and attributional style,
363 alternate research suggests that externalizing negative events may be a consequence of
364 feeling less control over them (Lee & Tiedens, 2001).

365 Incremental beliefs were related to more controllable, internal, global, and stable
366 attributions for positive events. For negative events, incremental beliefs were associated with
367 controllable and specific attributions. As with entity beliefs, these findings are consistent with
368 previous research suggesting that attributional style emanates from the more basic implicit

369 belief systems (Dweck & Leggett, 1988). The findings also extend on previous sports
370 attribution research by emphasizing the controllability dimension, as opposed to the classic
371 optimistic and pessimistic attributional styles which omit the controllability dimension and
372 construe factors as inherently controllable or uncontrollable (Parkes & Mallett, 2011;
373 Peterson, 1991). Given that perceptions of control are considered crucial risk factors in
374 anxiety relevant events, along with the results of the current research, controllability
375 attributions appear to be an important factor to be considered in relation to competition
376 anxiety (Chorpita, 2001). However, the association between incremental beliefs and internal
377 and unstable attributions for negative events was not significant. Although inconsistent with
378 previous studies utilizing the social-cognitive model of achievement motivation in the
379 intelligence domain (Diener & Dweck, 1980; Dweck, 1975), it has been found that
380 incremental beliefs tend to be universally high in sporting populations (Spray, Wang, Biddle,
381 Chatzisarantis, & Warburton, 2006). This may mean that incremental beliefs are not a good
382 predictor of outcomes and may account for the non-significant result.

383 Finally, attributional style was found to partially mediate the relationship between
384 implicit beliefs and competition anxiety for negative events. The globality and controllability
385 dimensions partially mediated the relationship between entity beliefs and competition anxiety
386 levels, as well as incremental beliefs and competition anxiety levels. Specifically, a tendency
387 to attribute negative events to global and uncontrollable causes partially mediated the positive
388 relationship between entity beliefs and competition anxiety, whereas a tendency to attribute
389 negative events to specific and controllable causes partially mediated the negative
390 relationship between incremental beliefs and competition anxiety. These findings build on
391 evidence from sports attribution research that suggests attributing negative events to global
392 causes engenders higher anxiety (Sanjuán et al., 2008). For example, an individual endorsing
393 entity beliefs may attribute the negative outcome to a lack of innate ability that impacts many

394 areas of life. In contrast, viewing the cause as specific engenders less anxiety (Martin-Krumm
395 et al., 2003). For example, an individual endorsing incremental beliefs may attribute the
396 negative outcome to a lack of effort in one particular game.

397 Interestingly, although the mediated relationship was only hypothesized for negative
398 events, the results indicated that a tendency to attribute outcomes to uncontrollable causes
399 partially mediated the negative relationship between entity beliefs and competition anxiety
400 for positive events. This was not expected as the current study adopted the definition of
401 competition anxiety as a response to a perceived threatening situation (Englert & Bertrams,
402 2012; Patel, 2010). However, this reinforces the key role that controllability attributions play
403 in the relationship between implicit beliefs and competition anxiety levels. Although feelings
404 of anxiety would be expected to be less salient following positive outcomes, uncontrollable
405 attributions primed by an entity belief system can still engender heightened competition
406 anxiety. Therefore, feeling less control over the outcome of an event, whether negative or
407 positive, contributes to greater feelings of anxiety. These results support the assumption of
408 the social-cognitive model of achievement motivation that implicit beliefs about the nature of
409 sports ability prime an individual's causal explanations about controllability and globality
410 which in turn influence competition anxiety levels.

411 Overall, the current research supported the theorized link between implicit beliefs and
412 attributional style. That is, that attributional style is shaped by, and arises from, the more
413 basic implicit belief systems (Dweck & Leggett, 1988). However, only the controllability and
414 globality dimensions were consistently linked with implicit beliefs. This evidence supports
415 the central role given to perceived control within the social-cognitive model of achievement
416 motivation, and its particular importance concerning competition anxiety. Moreover, these
417 results suggest that globality attributions may also be of importance, requiring greater
418 attention devoted to the globality dimension within the theory when applied to a sporting

419 context. As such, interventions aimed at reducing competition anxiety may benefit from
420 targeting athlete's attributions regarding globality and controllability in particular.

421 The findings of the current study challenge the traditional attribution theory used in
422 sports psychology research (Gordon, 2008; Kerr & Beh, 1995; Le Foll et al., 2006;
423 Miserandino, 1998). The results encourage a shift from the rigid optimistic and pessimistic
424 attributional style categories frequently used in sports attribution research, towards a theory
425 largely based around the previously omitted controllability dimension, and to a lesser extent
426 the globality dimension. The research also provides evidence to suggest that the internality
427 and stability dimensions are of less importance in relation to competition anxiety. As
428 proposed earlier, this may be a methodological issue caused by the dimensions confounding
429 with the controllability dimension. If this is so, scales incorporating these dimensions, such as
430 the short form Sports Attributional Style Scale (Hanrahan & Grove, 1990) used in this study,
431 will need to be reworked.

432 The findings may also have important practical implications for competition anxiety
433 sufferers. Identifying the belief systems and the specific type of attributions that are
434 associated with heightened competition anxiety levels, may enable practitioners to implement
435 strategies to alter these underlying beliefs and potentially regulate competition anxiety levels.
436 For example, as demonstrated in a study by Hong et al. (1999) in the intelligence domain,
437 implicit beliefs were able to be manipulated to establish a connection between entity beliefs
438 and negative outcomes, such as poorer coping and less persistence at challenging tasks, and
439 incremental beliefs and positive outcomes, such as taking remedial action and opting for
440 more challenging tasks after failure. More recently, implicit beliefs were also successfully
441 manipulated in the sporting domain (Spray et al., 2006). Future research could focus on
442 implementing the aforementioned coaching behaviors and instructional strategies suggested
443 by Vella et al. (2014) to promote incremental beliefs among athletes. Furthermore,

444 Miserandino (1998) conducted a study which implemented a four week attributional
445 retraining program that altered athlete's attributions and in turn improved their performance.
446 Therefore, if practitioners have the capacity to alter an individual's implicit beliefs and/or
447 attributional style they could potentially manipulate these cognitive processes to regulate
448 competition anxiety levels. In addition to implicit beliefs and attributional style, future
449 research may also benefit from considering the influence of appraisals, which have been
450 shown to be closely linked to anxiety levels in sport (Lazarus, 2000). Given that the present
451 findings showed that attributions of previous events partially explained the relationship
452 between implicit beliefs and competition anxiety, the evaluations of current events (i.e.,
453 appraisals) may further explain this relationship and enable researchers to gain a more
454 comprehensive understanding of competition anxiety.

455 **Strengths and Limitations**

456 The current study has a number of strengths. It is the first study to explore the
457 relationship between implicit beliefs and anxiety levels within the sporting domain. It is also
458 the first study to incorporate attributional style as a possible mediating factor linking implicit
459 beliefs with competition anxiety. Most importantly, the study investigates these novel
460 relationships using the social-cognitive model of achievement motivation as a theoretical
461 framework. The study is further strengthened by its use of valid and reliable psychometric
462 instruments that directly test the theory. Additionally, the utilization of bootstrapping
463 procedures enables the model to be directly tested, and provides information on how the
464 variables are interrelated, rather than merely describing the association.

465 The research is limited by a small sample size, which reduced statistical power and
466 generalizability of the findings. Moreover, participants in the sample ranged in age, years of
467 experience, time spent practicing, and competition level. Future research with more adequate
468 sample sizes should test for moderation effects among these variables. In order to strengthen

469 the theory as a predictor of competition anxiety, future studies should also incorporate
470 participants from a range of competitive sports. A reliance on self-report measures may have
471 also biased the results through socially desirable responding. Although the SCAT is a widely
472 used measure of competitive trait anxiety (Martens et al., 1990), future research may benefit
473 from using the more contemporary Sport Anxiety Scale-2 (SAS-2; Smith, Smoll, Cumming,
474 & Grossbard, 2006) which incorporates subscales for cognitive and somatic anxiety as well
475 as concentration disruption. Lastly, the cross-sectional nature of the study does not enable the
476 direction of causation to be determined. For instance, although the current study hypothesized
477 that it is differences in implicit beliefs that underpin anxiety responses, the findings do not
478 necessarily establish this directional relationship. Although they are consistent with the
479 theory that the hypothesis was derived from, it is also possible that anxiety responses may be
480 exerting an influence on an individual's beliefs. Future research is necessary to test these
481 relationships and support the results in other sports and domains.

482 **Conclusion**

483 The current research supported and extended on the theorized link between implicit
484 beliefs and competition anxiety, and highlighted the role that controllability and globality
485 attributions play as a mediator of the relationship. These findings have important
486 implications. Regarding implicit beliefs, the results have supported the extension of the
487 social-cognitive model of achievement motivation to the sporting domain and have also
488 supported the theory's use as a predictor of competition anxiety. The results concerning
489 attributional style suggest that classic attributional theory shifts its focus from optimistic and
490 pessimistic attributional styles to the importance of the controllability and globality
491 dimensions in sports attribution research. Finally, the findings are consistent with the theory
492 that implicit beliefs and attributional style are the cognitive processes underpinning anxiety,
493 and thus provide a potential theoretical framework for future anxiety research. In a practical

494 sense, the findings could be utilized in the development of interventions to promote
495 incremental beliefs and adaptive controllability and globality attributions. This could
496 potentially enable researchers to decrease competition anxiety levels and improve
497 performance, motivation, and psychological well-being among athletes (Draugelis, Martin, &
498 Garn, 2014; Hanton et al., 2003; Patel, 2010).

499

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Table 1

Correlations between Implicit Beliefs, Anxiety, and Dimensions of Attributional Style

Measure	Comp Anxiety	Pos Int	Pos Stab	Pos Glob	Pos Cont	Neg Int	Neg Stab	Neg Glob	Neg Cont
Incremental Beliefs	-.40**	.61**	.62**	.56**	.72**	.20	-.16	-.38*	.70**
Entity Beliefs	.31*	-.56**	-.46**	-.52**	-.61**	-.08	.29*	.36*	-.56**

Note. Pos Int = internality for positive events, Pos Stab = stability for positive events, Pos Glob = globality for positive events, Pos Cont = controllability for positive events, Neg Int = internality for negative events, Neg Stab = stability for negative events, Neg Glob = globality for negative events, Neg Cont = controllability for negative events. * $p < .05$, ** $p < .001$