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

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

Disciplines
Education | Social and Behavioral Sciences

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Keywords: Implicit theory; Entity beliefs; Incremental beliefs; Social-cognitive model of achievement motivation; Competition anxiety
For both elite and non-elite athletes, certain levels of competition anxiety are considered normal and even have the potential to positively influence performance (Hanton, O'Brien, & Mellalieu, 2003). However, excessive levels of competition anxiety are highly prevalent among athletes, resulting in adverse consequences such as impaired performance, reduced enjoyment and pleasure, and discontinued participation (Lazarus, 2000; Scanlan, Babkes, & Scanlan, 2005; Smith & Smoll, 1991). Clarification of the nature and influence of competition anxiety, therefore, has important implications for athletes’ performance and psychological well-being.

**Competition Anxiety**

Competition anxiety refers to the aversive emotional response associated with perceiving a competitive situation as potentially threatening (Englert & Bertrams, 2012).

There has long been recognition of the need to understand the antecedents of competition anxiety and improve conceptual clarity in this context (e.g., Gould, Petlichkoff, & Weinberg, 1984). It is argued that research must move beyond mere descriptions of anxiety by utilizing a strong theoretical framework to examine the underlying processes that are fundamental to perceiving the situation as threatening, and consequently resulting in the aversive emotional response (Hall & Kerr, 1998; Woodman & Hardy, 2003). A number of theories and models have been proposed to explore competition anxiety such as multidimensional anxiety theory (Martens, Vealey, & Burton, 1990), reversal theory (Apter, 1982), and catastrophe models (Hardy, 1990). More recently, appraisal theories such as Lazarus’ (1991) cognitive motivational relational theory have been applied to sport which highlight the role that cognitions play in generating emotional responses. It is proposed that it is the evaluation of the situation (i.e., the appraisals) that leads to the anxiety response (Lazarus, 2000). In other
domains, such as intelligence (Ruiselová & Prokopčáková, 2005) and physical activity (Ommundsen, 2001), Dweck and Leggett’s (1988) social cognitive model of achievement motivation has also demonstrated potential as a useful framework to investigate anxiety. Similar to the role of appraisals in the cognitive motivational relational theory, Dweck and Leggett’s (1988) concept of implicit beliefs are viewed as the core cognitive processes leading to the anxiety response. The current research aims to apply the social cognitive model of achievement motivation to the sports domain and utilize it as the theoretical framework to understand competition anxiety.

Social-Cognitive Model of Achievement Motivation

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

The social-cognitive model of achievement motivation emanated from earlier work on achievement goal orientations, and it is suggested that an individual’s implicit beliefs about ability orient them to favor either a performance goal or a learning goal (Dweck & Leggett,
1988; Elliott & Dweck, 1988). Studies have found that individuals endorsing entity beliefs tend to adhere to performance goals and those high in incremental beliefs tend to favor learning goals (Dweck, Chiu, & Hong, 1995b; Dweck & Leggett, 1988; Ommundsen, 2001). However, equivocal results surrounding achievement goals in the model have led to less of a focus on goals as a mediating construct, and it is argued that implicit theories themselves create a framework that fosters responses congruent with that framework (Cury, Elliot, Da Fonseca, & Moller, 2006; Dweck et al., 1995a; Harackiewicz & Elliot, 1995). As such, the current study focuses on the direct relationship between implicit beliefs and outcomes in achievement settings.

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

**The Role of Attributional Style**

Although there is a need to further investigate whether implicit beliefs are associated with competition anxiety, it is also important to understand how these variables are related. One possibility is that these associations are mediated by an individual’s attributional style,
which refers to the way individuals typically explain the causes of positive and negative events (Le Foll, Rasce, & Higgins, 2006). Mediation refers to a situation whereby an independent variable affects a dependent variable by influencing intervening variables known as the mediators (Hayes, 2009). In the present context, the social-cognitive perspective proposes that an individual’s underlying implicit beliefs affect their interpretation and explanation of events (i.e., attributional style), which in turn influences their emotional response (Dweck et al., 1995a; Dweck & Leggett, 1988). This suggests that attributional style could be an important variable linking implicit belief systems with emotional responses. In other words, attributional style could mediate the relationship between implicit beliefs and emotions, such as anxiety. The social-cognitive approach also proposes that any factor can be interpreted as controllable or uncontrollable, whereas the classic attributional approach construes factors as inherently controllable or uncontrollable (Dweck & Leggett, 1988).

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

According to the social-cognitive model of achievement motivation framework, attributional styles could provide an important link between underlying belief systems and anxiety (Dweck & Leggett, 1988). As individuals endorsing implicit entity or incremental
beliefs portray factors within themselves and the world as inherently fixed or malleable, they are therefore more likely to see this reflected in outcomes and subsequently explain events in these terms (Dweck & Leggett, 1988; Hong, Chiu, Lin, Wan, & Dweck, 1999). This link has been supported by Miserandino (1998) who found that basketball players trained to attribute performance to effort had more mastery-oriented responses and improved performance. However, Dweck et al. (1995) noted that the relationship between implicit theories and attributional style has not yet been formally established and thus there is a need for future research to explore this link.

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

Approaching sports attributional studies using the social-cognitive model of achievement motivation, rather than traditional attribution theory, may enable researchers to clarify previously equivocal findings. For example, classing individuals as holding either optimistic or pessimistic attributional styles means they must produce strictly opposite attributions in success and failure situations. However, if viewed in the context of the social-cognitive model of achievement motivation, it becomes apparent that this is not always the
case. Although an entity theorist is likely to make internal attributions to failure as they believe in fixed ability, an incremental theorist will not necessarily make external attributions. Endorsing incremental beliefs involves a focus on effort which, like ability, is also internal to the individual (Robins & Pals, 2002). Furthermore, the controllability dimension is omitted from the pessimistic and optimistic attributional styles, although it is a central element within the social-cognitive model of achievement motivation. Viewing ability as inherently fixed within entity beliefs would therefore lead the individual to interpret it as an uncontrollable factor. In contrast, individuals endorsing incremental beliefs view ability as increasable through effort and thus controllable (Dweck & Leggett, 1988).

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

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

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

Methods

Participants

Participants comprised 72 soccer players (42 males, 30 females) between 17 and 44 years of age ($M = 24.31, SD = 5.22$) from high level amateur and semi-professional teams in the Illawarra and Southern Sydney region of New South Wales. The sample consisted of 36.1% ($n = 26$) of participants from the Men’s Semi-Professional League, 27.8% ($n = 20$)
from the Women’s Semi-Professional League, 22.2% \((n = 16)\) from the Men’s Amateur League, and 13.9% \((n = 10)\) from the Women’s Amateur League. Of the 72 participants, 77.8% \((n = 56)\) described their ethnic background as Australian, 18.1% \((n = 13)\) as European, 1.4% \((n = 1)\) as Middle Eastern, 1.4% \((n = 1)\) as Asian, and 1.4% \((n = 1)\) as other. Participant’s number of years of experience playing soccer ranged from 4 to 33 \((M = 15.58, SD = 6.29)\) and their hours spent training each week ranged from 1 to 15 \((M = 4.98, SD = 3.28)\).

**Procedure**

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

**Measures**

**Implicit Beliefs.** The Conceptions of the Nature of Athletic Ability Questionnaire- Version 2 (CNAAQ-2; Biddle, Wang, Chatzisarantis, & Spray, 2003) assessed implicit incremental and entity beliefs. The questionnaire consists of 12 items assessing four subscales of beliefs about athletic ability (three items for each subscale). The Learning subscale (e.g., ‘You need to learn and to work hard to be good at sport’) and the Improvement subscale (e.g., ‘In sport, if you work hard at it, you will always get better’) are summed to assess Incremental beliefs. The Gift subscale (e.g., ‘To be good at sport you need to be naturally gifted’) and the Stable subscale (e.g., ‘It is difficult to change how good you are in...
sport’) are summed to assess Entity beliefs. For each item, participants were asked to respond on a five-point scale ranging from 1 (strongly disagree) to 5 (strongly agree). This scale has been shown to produce valid and reliable estimates of entity and incremental beliefs (Biddle et al., 2003) with satisfactory internal consistency within adult populations (Blackwell, Trzesniewski, & Dweck, 2007; Wang & Koh, 2006). Cronbach’s alpha in the current study was $\alpha = .87$ (entity beliefs), $\alpha = .83$ (incremental beliefs).

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

**Attributional Style.** Adapted from the Sports Attributional Style Scale (Hanrahan, Grove, & Hattie, 1989) the short form Sports Attributional Style Scale (Hanrahan & Grove, 1990) was used to measure sports-related attributional style. The scale consists of five positive (e.g., ‘You perform very well in a competition’) and five negative (e.g., ‘The coach criticizes your performance’) hypothetical sporting situations that are matched for content. Participants were instructed to imagine themselves in the situation and record the single most likely cause of that event happening to them. Respondents rated the cause along a seven-point
scale for each of the attributional dimensions (Internal/External, Stable/Unstable, Global/Specific, Controllable/Uncontrollable). Due to debate over Intentionality confounding with other dimensions and for the purpose of this study, only the Internality, Stability, Globality and Controllability dimensions were deemed relevant and were subsequently used (Hanrahan & Grove, 1990; Kelley & Michela, 1980; Russell, 1982). The Cronbach’s alpha coefficients for the four subscales in the current study ranged from .81 to .91 for both positive and negative events.

**Statistical Analysis**

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

**Results**

**Correlations**

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

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

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

**Incremental beliefs and anxiety through attributional style for negative events.**
The multiple mediation model linking incremental beliefs with competition anxiety levels through the dimensions of attributional style for negative events found incremental beliefs to be negatively related to Globality, $\beta = -.56$, $p = .021$, and positively related to controllability, $\beta = 1.36$, $p < .001$. Globality, $\beta = .23$, $p = .021$, and Controllability, $\beta = -.24$, $p = .027$, were also significantly related to competition anxiety levels. The total effect ($c$ path) of incremental beliefs on anxiety was significant, $\beta = -.55$, $p < .001$. However, the association between incremental beliefs and competition anxiety attenuated and was not significant when attributional style for negative events ($c’$ path) was included in the model, $\beta = -.14$, $p = .489$. 
The bootstrap tests of the indirect effects linking incremental beliefs with competition anxiety indicated that for negative events, Internality, $\beta = .033$, [-.01, .16], and Stability, $\beta = -.02$ [-.04, .18], were not significant. However, the indirect effect linking incremental beliefs with competition anxiety levels for negative events through Globality, $\beta = -.14$ [-.36, -.01], and Controllability, $\beta = -.32$ [-.75, -.03], was significant. This suggests that controllable and specific attributions partially mediated the inverse relationship between incremental beliefs and competition anxiety levels for negative events.

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

Indirect bootstrap effects linking entity beliefs with competition anxiety for positive events indicated that the Internality, $\beta = -.05$, [-.29, .17]; Stability, $\beta = -.05$ [-.25, .15]; and Globality, $\beta = .07$ [-.14, .35]; dimensions were not significant. However, the indirect effect linking entity beliefs with competition anxiety levels for positive events through Controllability was significant, $\beta = .26$ [.01, .57]. This suggests that uncontrollable attributions partially mediated the positive relationship between entity beliefs and competition anxiety levels for positive events.
Entity beliefs and anxiety through attributional style for negative events. The multiple mediation model linking entity beliefs with competition anxiety levels through the dimensions of attributional style for negative events found entity beliefs to be positively associated with Stability, $\beta = .35$, $p = .030$; and Globality, $\beta = .48$, $p = .006$; and inversely associated with Controllability, $\beta = -.81$, $p < .001$. Globality, $\beta = .23$, $p = .021$, and Controllability, $\beta = -.24$, $p = .012$, were also significantly related to competition anxiety levels. The total effect ($c$ path) of entity beliefs on competition anxiety was significant, $\beta = .41$, $p < .001$. The association between entity beliefs and competition anxiety attenuated and was not significant when negative events ($c'$ path) was included in the model, $\beta = .13$, $p = .329$.

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

Discussion

The present study indicated significant associations between implicit beliefs, attributional style, and competition anxiety. Consistent with our hypotheses, entity beliefs were associated with higher levels of competition anxiety. This compliments research in other areas such as the intelligence domain (Ruiselová & Prokopcáková, 2005) and the physical activity domain (Ommundsen, 2001). In regards to incremental beliefs, previous research has tended to focus on the relationship with heightened positive affect, rather than lowered negative affect, such as anxiety (Ommundsen, 2001). The finding that incremental
beliefs were associated with lower levels of competition anxiety could be valuable to anxiety researchers as they may focus on making incremental beliefs more salient among athletes. For example, Vella, Cliff, Okely, Weintraub, and Robinson (2014) proposed that coaching behaviors and instructional strategies can be used to facilitate incremental beliefs. These include focusing on effort and persistence, facilitating challenge, promoting the value of failure, defining success as effort, the promotion of learning, and providing high expectations.

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

Incremental beliefs were related to more controllable, internal, global, and stable attributions for positive events. For negative events, incremental beliefs were associated with controllable and specific attributions. As with entity beliefs, these findings are consistent with previous research suggesting that attributional style emanates from the more basic implicit
belief systems (Dweck & Leggett, 1988). The findings also extend on previous sports attribution research by emphasizing the controllability dimension, as opposed to the classic optimistic and pessimistic attributional styles which omit the controllability dimension and construe factors as inherently controllable or uncontrollable (Parkes & Mallett, 2011; Peterson, 1991). Given that perceptions of control are considered crucial risk factors in anxiety relevant events, along with the results of the current research, controllability attributions appear to be an important factor to be considered in relation to competition anxiety (Chorpita, 2001). However, the association between incremental beliefs and internal and unstable attributions for negative events was not significant. Although inconsistent with previous studies utilizing the social-cognitive model of achievement motivation in the intelligence domain (Diener & Dweck, 1980; Dweck, 1975), it has been found that incremental beliefs tend to be universally high in sporting populations (Spray, Wang, Biddle, Chatzisarantis, & Warburton, 2006). This may mean that incremental beliefs are not a good predictor of outcomes and may account for the non-significant result.

Finally, attributional style was found to partially mediate the relationship between implicit beliefs and competition anxiety for negative events. The globality and controllability dimensions partially mediated the relationship between entity beliefs and competition anxiety levels, as well as incremental beliefs and competition anxiety levels. Specifically, a tendency to attribute negative events to global and uncontrollable causes partially mediated the positive relationship between entity beliefs and competition anxiety, whereas a tendency to attribute negative events to specific and controllable causes partially mediated the negative relationship between incremental beliefs and competition anxiety. These findings build on evidence from sports attribution research that suggests attributing negative events to global causes engenders higher anxiety (Sanjuán et al., 2008). For example, an individual endorsing entity beliefs may attribute the negative outcome to a lack of innate ability that impacts many
areas of life. In contrast, viewing the cause as specific engenders less anxiety (Martin-Krumm et al., 2003). For example, an individual endorsing incremental beliefs may attribute the negative outcome to a lack of effort in one particular game.

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

Overall, the current research supported the theorized link between implicit beliefs and attributional style. That is, that attributional style is shaped by, and arises from, the more basic implicit belief systems (Dweck & Leggett, 1988). However, only the controllability and globality dimensions were consistently linked with implicit beliefs. This evidence supports the central role given to perceived control within the social-cognitive model of achievement motivation, and its particular importance concerning competition anxiety. Moreover, these results suggest that globality attributions may also be of importance, requiring greater attention devoted to the globality dimension within the theory when applied to a sporting
context. As such, interventions aimed at reducing competition anxiety may benefit from targeting athlete’s attributions regarding globality and controllability in particular.

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

The findings may also have important practical implications for competition anxiety sufferers. Identifying the belief systems and the specific type of attributions that are associated with heightened competition anxiety levels, may enable practitioners to implement strategies to alter these underlying beliefs and potentially regulate competition anxiety levels. For example, as demonstrated in a study by Hong et al. (1999) in the intelligence domain, implicit beliefs were able to be manipulated to establish a connection between entity beliefs and negative outcomes, such as poorer coping and less persistence at challenging tasks, and incremental beliefs and positive outcomes, such as taking remedial action and opting for more challenging tasks after failure. More recently, implicit beliefs were also successfully manipulated in the sporting domain (Spray et al., 2006). Future research could focus on implementing the aforementioned coaching behaviors and instructional strategies suggested by Vella et al. (2014) to promote incremental beliefs among athletes. Furthermore,
Miserandino (1998) conducted a study which implemented a four week attributional retraining program that altered athlete’s attributions and in turn improved their performance. Therefore, if practitioners have the capacity to alter an individual’s implicit beliefs and/or attributional style they could potentially manipulate these cognitive processes to regulate competition anxiety levels. In addition to implicit beliefs and attributional style, future research may also benefit from considering the influence of appraisals, which have been shown to be closely linked to anxiety levels in sport (Lazarus, 2000). Given that the present findings showed that attributions of previous events partially explained the relationship between implicit beliefs and competition anxiety, the evaluations of current events (i.e., appraisals) may further explain this relationship and enable researchers to gain a more comprehensive understanding of competition anxiety.

**Strengths and Limitations**

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

The research is limited by a small sample size, which reduced statistical power and generalizability of the findings. Moreover, participants in the sample ranged in age, years of experience, time spent practicing, and competition level. Future research with more adequate sample sizes should test for moderation effects among these variables. In order to strengthen
the theory as a predictor of competition anxiety, future studies should also incorporate participants from a range of competitive sports. A reliance on self-report measures may have also biased the results through socially desirable responding. Although the SCAT is a widely used measure of competitive trait anxiety (Martens et al., 1990), future research may benefit from using the more contemporary Sport Anxiety Scale-2 (SAS-2; Smith, Smoll, Cumming, & Grossbard, 2006) which incorporates subscales for cognitive and somatic anxiety as well as concentration disruption. Lastly, the cross-sectional nature of the study does not enable the direction of causation to be determined. For instance, although the current study hypothesized that it is differences in implicit beliefs that underpin anxiety responses, the findings do not necessarily establish this directional relationship. Although they are consistent with the theory that the hypothesis was derived from, it is also possible that anxiety responses may be exerting an influence on an individual’s beliefs. Future research is necessary to test these relationships and support the results in other sports and domains.

Conclusion

The current research supported and extended on the theorized link between implicit beliefs and competition anxiety, and highlighted the role that controllability and globality attributions play as a mediator of the relationship. These findings have important implications. Regarding implicit beliefs, the results have supported the extension of the social-cognitive model of achievement motivation to the sporting domain and have also supported the theory’s use as a predictor of competition anxiety. The results concerning attributional style suggest that classic attributional theory shifts its focus from optimistic and pessimistic attributional styles to the importance of the controllability and globality dimensions in sports attribution research. Finally, the findings are consistent with the theory that implicit beliefs and attributional style are the cognitive processes underpinning anxiety, and thus provide a potential theoretical framework for future anxiety research. In a practical
sense, the findings could be utilized in the development of interventions to promote incremental beliefs and adaptive controllability and globality attributions. This could potentially enable researchers to decrease competition anxiety levels and improve performance, motivation, and psychological well-being among athletes (Draugelis, Martin, & Garn, 2014; Hanton et al., 2003; Patel, 2010).
References


Table 1

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

<table>
<thead>
<tr>
<th>Measure</th>
<th>Comp Anxiety</th>
<th>Pos Int</th>
<th>Pos Stab</th>
<th>Pos Glob</th>
<th>Pos Cont</th>
<th>Neg Int</th>
<th>Neg Stab</th>
<th>Neg Glob</th>
<th>Neg Cont</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incremental Beliefs</td>
<td>-.40**</td>
<td>.61**</td>
<td>.62**</td>
<td>.56**</td>
<td>.72**</td>
<td>.20</td>
<td>-.16</td>
<td>-.38*</td>
<td>.70**</td>
</tr>
<tr>
<td>Entity Beliefs</td>
<td>.31*</td>
<td>-.56**</td>
<td>-.46**</td>
<td>-.52**</td>
<td>-.61**</td>
<td>-.08</td>
<td>.29*</td>
<td>.36*</td>
<td>-.56**</td>
</tr>
</tbody>
</table>

*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