Changes in Task Self-Efficacy and Emotion across Competitive Performances in Golf

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Running Head: SELF-EFFICACY AND AFFECT IN GOLF

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Abstract

This research aimed to investigate (a) the effect of golfers' perceptions of coach motivation efficacy on golfers' pre-competition task self-efficacy, (b) the effect of performance on pre- to post-round changes in self-efficacy, (c) the effect of pre- to post-round changes in self-efficacy on pre- to post-round changes in affect and emotion, and (d) whether any effects of performance on pre- to post-competition changes in affect and emotion were mediated by pre- to post-competition changes in self-efficacy. In Study 1, a scale measuring golf self-efficacy was developed and validated using data from 197 golfers. In Study 2, 200 golfers completed this measure alongside measures of coach motivation efficacy, and positive and negative affect prior to a golf competition; all measures (except coach motivation efficacy) were again completed following the competition. Structural equation modeling showed coach motivation efficacy positively predicted pre-competition self-efficacy, performance positively predicted pre- to post-competition changes in self-efficacy, which had positive and negative effects, respectively, on pre- to post-competition changes in positive and negative affect; mediation analyses demonstrated pre- to post-competition changes in self-efficacy mediated effects of performance on pre- to post-competition changes in positive and negative affect. In Study 3, Study 2 procedures were replicated with a separate sample of 212 golfers, except measures of excitement, concentration disruption, somatic anxiety and worry replaced those for positive and negative affect. Structural analyses showed the findings from Study 2 were largely replicated when specific emotions were investigated in place of general indices of affect. This investigation makes novel contributions regarding the potential importance of perceptions of coach efficacy for golfers' own efficacy beliefs, and the role personal efficacy beliefs may play in facilitating the effects of performance on affective outcomes.

Changes in Task Self-Efficacy and Emotion across Competitive Performances in Golf

Introduction

Self-efficacy is conceptualized as a person's belief in his/her capacity to organize and execute the required skills to attain a specific desired outcome (Bandura, 1997). As such, this construct is concerned with the beliefs of an individual regarding what s/he can achieve with the skills s/he possesses rather than his/her actual level of skill. Self-efficacy has been described as one of the most influential psychological constructs mediating achievement striving in sport (Feltz, 1988). Indeed, meta-analytical research suggests self-efficacy facilitates performance accomplishments in sport (Moritz, Feltz, Fahrback, & Mack, 2000). One way in which self-efficacy may influence achievement in sport is through its potential role in regulating affective states (Bandura, 1997; Feltz, Short, & Sullivan, 2008). However, researchers to date have not explored how changes in self-efficacy across a competitive performance correspond with changes in affect across the same performance. As such, the overarching aim of the current research was to investigate this topic.

According to Bandura, an important process through which self-efficacy can influence human functioning is through its "pivotal role in the regulation of affective states" (1997, p.137). Importantly, efficacy beliefs are proposed to impact upon both positive (e.g., enjoyment, satisfaction) and negative (e.g., anxiety, boredom) affective outcomes, mainly through the creation of attention biases and their influence on how we construe important life events (Bandura, 1997). More specifically, those with high levels of self-efficacy are more likely to focus their attention on positive aspects of life experiences and construe them in more positive ways, whereas those holding low levels of self-efficacy have a tendency to attend to negative components and to construe experiences negatively. As such, self-efficacy is expected to have positive and negative relationships, respectively, with positive and negative affect in the specific context to which the efficacy beliefs relate.

Overall, research in sport has supported the relationships between self-efficacy and affective states proposed by Bandura (1997). For instance, studies with high-school wrestlers (Treasure, Monson, & Lox, 1996), wheelchair road racers (Martin, 2002), and wheelchair basketball players (Martin, 2008) have all found self-efficacy positively predicts positive affect, and negatively predicts negative affect. However, an important limitation of research in this area to date is that researchers have typically investigated only the relationship between self-efficacy and affect *prior to* competition rather than pre- *and* post-competition (see Welch, Hulley, & Beauchamp, 2010). Given Bandura (1997) proposes that self-efficacy beliefs alter with experience, in sport one would expect to see changes in efficacy beliefs across competitive performances. Further, one would expect theoretically associated variables – such as affective states – to undergo corresponding changes as efficacy levels fluctuate. As such, research investigating the relationships amongst changes in self-efficacy and positive and negative affect across a competitive performance would make an important contribution to research investigating this aspect of Bandura's (1997) theory in sport.

Exploring the sources of information that contribute to athletes' self-efficacy beliefs is also an important area of investigation relating to Bandura's (1997) theory. According to Bandura, self-efficacy beliefs are constructed from four principal sources of information: enactive mastery experiences (i.e., repeated and consistent successful execution of a skill), vicarious experiences (i.e., observation of similar others successfully completing a skill), verbal persuasion (i.e., being told by a trusted source that one can successfully accomplish a skill) and physiological and affective states (i.e., interpreting one's physiological and emotional state as having a facilitative impact on execution of the skill). Thus, given the apparent importance of optimizing athletes' levels of self-efficacy, it is important researchers investigate key agents in the sport environment who have the potential to shape athletes' experiences of these four sources of information.

One person in the sport environment who has the potential to play an agentic role in shaping athletes' experiences of all four sources of information relevant to efficacy beliefs is an athlete's coach (e.g., Gould, Hodge, Peterson, & Giannini, 1989; Vargas-Tonsing, Myers, & Feltz, 2004; Weinberg & Jackson, 1990). For instance, coaches can potentially influence enactive mastery experiences through use of appropriate instruction and drilling that leads to successfully performance of skills. Coaches can also facilitate vicarious experiences in athletes, by acting as a confident model (e.g., Jackson & Beauchamp, 2010). The third source of efficacy information – verbal persuasion – can also be influenced by coaches, as coaches can themselves provide verbal praise to athletes, or alternatively they can encourage athletes to utilize efficacy-enhancing self-talk statements. Finally, athletes' interpretation of their physiological and affective states can also be influenced by coaches through techniques such as emphasizing that anxiety represents readiness for performance rather than fear. Through the use of techniques such as those outlined above, coaches have the potential to be a key influence on self-efficacy in athletes. Importantly, models of coach effectiveness have highlighted the importance of athletes' perceptions of their coach when considering the influence of coaching behaviors on athlete-level outcomes such as athlete self-efficacy (e.g., Horn, 2008).

One model that has been used by researchers to investigate the influence of athletes' perceptions of their coach on athlete-level outcomes is the coaching efficacy model (Feltz, Chase, Moritz & Sullivan, 1999). Coaching efficacy is defined as the belief coaches have in their ability to affect the learning and performance of their athletes, and was conceptualized by Feltz et al. (1999) as having four dimensions (i.e., motivation, technique, game strategy, and character building). Importantly, high levels of coaching efficacy were proposed by Feltz et al. (1999) to lead to more effective coaching behaviors, as well as adaptive athlete-level outcomes such as increased self-efficacy. As suggested previously (i.e., Boardley, Kavussanu, & Ring, 2008; Myers, Feltz, Maier, Wolfe, & Reckase, 2006), it is possible these two outcomes are linked, in that more effective coaching behaviors would be expected to lead to adaptive athlete-level outcomes such as increases in self-efficacy. Further, relevant models of coach effectiveness suggest athletes' perceptions of their coach's behavior mediate the effect of coaches' behavior on athlete self-beliefs such as self-efficacy (Horn, 2008). Importantly, research investigating athletes' perceptions of their coach based upon the coaching efficacy model has demonstrated the original dimensionality of the coaching efficacy model is upheld when investigating athletes' perceptions (e.g., Boardley et al., 2008; Myers, Feltz et al., 2006). As such, the coaching efficacy model appears to be an appropriate framework for researchers looking to investigate potential links between athletes' perceptions of their coach and athlete-level outcomes.

The first study to link athletes' perceptions of their coach on one of the dimensions of coaching efficacy with athlete-level outcomes was conducted by Myers, Wolfe, Maier, Feltz, and Reckase (2006). In this research, soccer and ice-hockey players' perceptions of their coach's motivation (i.e., the ability to affect the psychological skills and states of their athletes) competency were found to be positively associated with athletes' satisfaction with their coach. Subsequently, Boardley et al. (2008) demonstrated rugby players' perceptions of their coach's motivation effectiveness positively predicted athletes' effort, commitment, and enjoyment. Further, athletes' perceptions of their coach's technique (i.e., the ability to teach and demonstrate the skills of their sport) effectiveness positively predicted athletes' task self-efficacy. Finally, athletes' perceptions of their coach's character building (i.e., the ability to influence athletes' personal development and positive attitude toward sport) effectiveness positively predicted athletes' prosocial behavior. Thus, the work of Myers, Wolfe et al. (2006) and Boardley et al. (2008) provide support for the importance of athletes' perceptions of their coach based on coaching efficacy dimensions when investigating athlete-level outcomes.

Although the studies reviewed above both investigated athletes' perceptions of their coach on dimensions of coaching efficacy, Myers, Feltz et al. (2006) and Boardley et al. (2008) differed slightly in how they assessed such perceptions. More specifically, Myers Feltz et al. assessed perceptions of *coaching competency* (i.e., "athletes' evaluations of their head coach's ability to affect their learning and performance" [p. 113]), whereas Boardley et al. (2008) assessed perceptions of *coaching effectiveness* (i.e., "athletes' evaluations of the extent to which coaches can implement their knowledge and skills to positively affect the learning and performance of their athletes" [p.271]). Although both approaches appear valid, an alternative approach would be to assess athletes' perceptions of their coach's *efficacy*. As well as being consistent with the assessment strategy used to originally develop the coaching efficacy model, such an approach has also been used successfully by other researchers investigating the relationships between individuals' ratings of their own efficacy beliefs and those of their coach (e.g., Jackson, Grove, & Beauchamp, 2010). In such work, Jackson and colleagues successfully used the coaching efficacy scale to assess athletes' perceptions of *other-efficacy* regarding their coach (athletes' beliefs about their coach's ability to coach). Jackson and co-workers adopted the term other-efficacy because their work was conceptually grounded in the tripartite efficacy framework of Lent and Lopez (2002). Given our work is more closely aligned with the coaching efficacy model – and not that of Lent and Lopez (2002) – we have adopted the terminology from the model of Feltz et al. (1999) when referring to athletes' perceptions of their coach's efficacy.

Of the four dimensions of coaching efficacy, athletes' perceptions their coach's motivation efficacy may be of particular importance when considering potential influences on athletes' self-efficacy beliefs. Importantly, assessment of coaches' motivation efficacy includes rating a coaches' ability to build athletes' self-confidence, and to maintain confidence in players. Given that players' perceptions of their coach are thought to be based on their observations of relevant coaching behaviors (Horn, 2008), athletes rating their coach highly on motivation efficacy are likely to have been exposed to coaching behaviors perceived to build athletes' self-confidence and maintain confidence in athletes. As such, as self-efficacy represents a situation-specific form of self-confidence, athletes' perceptions of their coach's motivation efficacy would appear to be particularly relevant when considering potential influences of athletes' self-efficacy beliefs.

An alternative dimension of coaching efficacy relevant to athletes' self-efficacy beliefs is the technique dimension (see Boardley et al., 2008). More specifically, as technique efficacy represents a coach's ability to teach and demonstrate the skills of his/her sport (Feltz et al., 1999), athletes' perceptions of their coach on this dimension are most likely informed by behaviors relating to coaches' use of instruction and drills and their ability to be a confident model (see earlier discussion of coaching behaviors potentially leading to increased self-efficacy in players). Thus, although relevant, it could be argued that perceptions of technique efficacy are likely based upon a narrower range of behaviors than those potentially drawn upon to form perceptions of motivation efficacy. More explicitly, given motivation efficacy explicitly considers a coach's ability to build and maintain athletes' self-confidence, athletes' perceptions of their coach's motivation efficacy could therefore be influenced by any of the efficacy-enhancing coaching behaviors previously discussed. For these reasons, in the current study we chose to focus on athletes' perceptions of their coach's motivation – rather than technique – efficacy.

Self-efficacy may be of particular importance in the sport of golf, because skill performance constitutes only a very small percentage of overall playing time, with the majority of time being spent moving around the course and waiting to perform (see Bois, Sarrazin, Southon, & Boiché, 2009). This provides considerable thinking time during which psychological factors – such as self-efficacy – can enact any influence they may have on key outcomes such as positive and negative affect. Although the relationship between self-efficacy and affect in golf has not been investigated through quantitative research to date, qualitative research with 12 male professional golfers supports the potential importance of self-efficacy for maintaining desirable emotional states (Valiente & Morris, 2013). For example, one player described how strong efficacy beliefs prevented him from experiencing negative emotions following poor shots, because he felt confident he could make up for any such errors with subsequent shots. Further, this player also explained how he felt more excited when confidence levels were high. Importantly, the study findings also supported the potential importance of coaches for bolstering efficacy beliefs in golf, with one player describing how his college coach had a positive effect on his self-efficacy beliefs through verbal persuasion. Additional evidence for the importance of self-efficacy in golf is apparent in the work of Beauchamp, Bray, and Albinson (2002) that identified a moderately strong effect of pre-round-self-efficacy on performance in collegiate golfers. Therefore, self-efficacy may be of particular importance in golf, and research to date supports the importance of investigating both predictors and outcomes of self-efficacy in golf.

The Current Research

Based upon the literature reviewed to this point, the current research sought to address a number of research aims. First, we aimed to determine the predictive effect of golfers' perceptions of their coach's motivation efficacy on golfers' pre-competition task self-efficacy beliefs. When looking to predict players' task self-efficacy, we accounted for the effect of their golf handicap, because golf handicap has been shown to be a significant predictor of pre-round self-efficacy in golfers (Bruton, Mellalieu, Shearer, Roderique-Davies, & Hallet, 2013). Second, we sought to investigate the effect of performance on pre- to post-round changes in task self-efficacy. Given considerable research has investigated the effect of self-efficacy on performance in sport (see Moritz et al., 2000 for a meta-analysis) including golf (Beauchamp et al., 2002), further investigation of this relationship was not a primary aim here. We were interested however, in the relationship between performance and changes in task self-efficacy across a golf competition, as research to date has not investigated this important association. Third, we aimed to investigate the predictive effect of pre- to post-round changes in task self-efficacy on pre- to post-round changes in positive and negative affect. Finally, we sought to determine whether any predictive effects of competitive performance on pre- to post-competition changes in positive and negative affect were mediated by pre- to post-competition changes in task self-efficacy. These four aims were addressed through three studies; specific objectives and hypotheses (when relevant) are identified within each individual study.

Study 1

Study Aims

The primary aim of Study 1 was to develop and validate a measure of task self-efficacy in golf. We felt this necessary because previous research that has developed measures of golf self-efficacy has presented minimal evidence for the psychometric properties of the measures developed. For instance, neither Beauchamp et al. (2002) nor Bruton et al. (2013) investigated the factor structure of the golf self-efficacy measures they developed and utilized in their studies. As such, we sought to develop and validate a measure of task self-efficacy in golf for use in the subsequent studies.

Method

Participants. Participants were male (*n* = 131) and female (*n* = 66) competitive golfers playing in the Midlands region of England. Players ranged in age from 14.00 to 68.60 years (*M* = 27.74, *SD* = 13.26), had played golf for an average of 9.52 years (*SD* = 8.27), practiced / competed at golf for an average of 8.90 hours/week (*SD* = 9.70), with an average of 1.17 of those hours (*SD* = 2.30) being coached each week. The highest level at which participants played at that time included recreational (*n* = 89), local (*n* = 44), university (*n* = 18), regional (*n* = 32), state (*n* = 6), national (*n* = 7), and international (*n* = 1) levels. All players were coached for at least one hour per month.

Measures

*Task Self-Efficacy***.** Guided by Bandura's (2006) scale construction recommendations, a golf-specific measure of task self-efficacy was developed for use in the subsequent studies. First, a focus group consisting of six expert (Handicap <4) golfers was formed, and asked to identify and discuss the primary skills required for optimal performance in golf. Then, based upon their discussions, focus-group members were asked to create a list of skills that represented all of the main tasks required for optimal performance in golf, whilst keeping redundancy to a minimum. The final list consisted of seven skills, with each being separately assessed in terms of distance (i.e., hit a particular shot the required distance) and direction (i.e., hit a particular shot in the correct direction), creating a total of 14 items. Following the focus group, this list of skills was presented to a separate group of six expert golfers (Handicap <4), and reviewed by three experienced sport-psychology researchers. All nine respondents agreed that the list represented all of the main skills required to perform well in golf, although some minor wording changes were made for clarity and consistency based upon feedback received. These modifications resulted in a final pool of 14 items which were then used in further testing.

Data were then collected using all 14 items. When administering the scale, participants were asked to indicate the degree of confidence they currently had in their ability to successfully perform certain skills and actions, followed by a list of the 14 items preceded by the stem: "How confident are you that you can successfully…". Responses were made on a 5-point scale anchored by 1 (*no confidence at all*) and 5 (*complete confidence*). Although Bandura (2006) recommends the use of an 11-point response format for measuring efficacy beliefs, psychometric analyses in physical activity contexts have provided support for the use of 5-point response formats when assessing efficacy-based constructs (Myers, Feltz, & Wolfe, 2008; Myers, Wolfe, & Feltz, 2005).

*Coaching Motivation Efficacy***.** Athletes' perceptions of their coach's motivation efficacy were measured using an adaptation of the motivation subscale from the Coaching

Efficacy Scale (CES; Feltz et al., 1999). The items in the adapted measure were identical to those in the relevant subscale of the CES. However, rather than coaches being asked to rate their confidence in their own ability for each item – as in the CES – athletes were asked to rate their confidence in their coach's ability on the seven motivation items by circling the appropriate number. Four items that originally referred to "your players" were also adapted slightly to refer to "his/her players; for example, the CES item "build the self-confidence of *your* players" became "build the self-confidence of *his/her* players". The stem for all items was "How confident are you in your coach's ability to …". Athletes rated each item on a scale from 1 (*no confidence at all*) to 5 (*complete confidence*). Similar adaptations of the CES have been successful, with a previous adaptation to create a measure of athletes' perceptions of coaching effectiveness proving valid and reliable (Kavussanu, Boardley, Jutkiewicz, Vincent, & Ring, 2008).

Procedures. First, ethical approval was obtained from the ethics committee of the first author's institution. Head professionals from 29 golf clubs in the target region were then contacted by email and/or telephone by one of three trained research assistants to inform them of the nature of the study and request the opportunity to invite players from their clubs to participate. All head professionals gave their permission for one of the research assistants to speak to players from their club, and arrangements were made for a convenient opportunity to visit each club. Data collection occurred at club driving ranges, conducted by one of the research assistants. Players arriving at the driving range were approached and informed about the nature of the investigation, what participation involved, and the rights of study participants. Players were then made aware (verbally and in writing) that nobody other than the research team would have access to their responses at any stage, before being provided with an opportunity to ask questions. Those agreeing to participate were then asked to provide their informed consent (or assent plus parental consent for under 16's), before being instructed to complete the questionnaire pack privately and individually.

Data Analysis. First, inter-item correlations were calculated to ensure these fell within the desired range for newly developed scales (.15 – .50; see Clark & Watson, 1995), and skewness and kurtosis values calculated to identify any items with non-normal distributions. Next, the factor structure of the scale was investigated using Exploratory Factor Analysis (EFA) before being confirmed using Confirmatory Factor Analysis (CFA). All CFA and Structural Equation Modeling (SEM) analyses were conducted using the EQS 6.1 statistical package with the maximum likelihood estimator (Bentler & Wu, 2002). When conducting CFA and SEM, researchers often determine model fit based upon a range of fit indices. However, there is a lack of consensus on such an approach, with some experts recommending against it (Barrett, 2007), whereas others propose including a specific range of fit indices (Bentler, 2007). As such, we have provided the following fit indices recommended by Bentler (2007) when testing models using CFA and SEM for the interested reader: Satorra–Bentler chi-square (χ^2); robust comparative fit index (CFI); standardized root mean square residual (SRMR); robust root mean square error of approximation (RMSEA).

Once the factor structure of the scale was determined, reliability was estimated by calculating the composite reliability coefficient (see Raykov, 1997), which is obtained using structural equation modeling (SEM). This was computed in preference to the Cronbach's alpha coefficient because the latter has been shown to be a lower bound to the reliability of a scale and therefore can underestimate scale reliability. Once the factor structure and reliability of the final scale had been determined, the correlation between task self-efficacy and coaching motivation efficacy was computed to provide evidence for the concurrent validity of the new scale.

Results

Missing Data and Item Analysis. All questionnaires were fully completed; therefore there were no missing data. Calculation of skewness and kurtosis values for each item determined that no items had severely non-normal distributions. Subsequent inter-item correlation analyses demonstrated that item pairs relating to the same skill (e.g., “Consistently drive the ball the desired distance” and “Consistently drive the ball on the desired line”) were considerably (*M* = .74) outside the target range of .15–.50 (see Clark & Watson, 1995). Given the level of redundancy in these items pairs, and the fact that retaining both items in each pair would potentially have detrimentally affected the subsequent factor analyses, the decision was taken to retain the seven items relating to striking the ball on the desired line. This aspect of skill execution (i.e., accuracy) was considered to be of greater importance to performance in golf in comparison to hitting the ball the target distance as hitting the ball the required distance but on the incorrect line tends to result in greater detriment to performance than striking a shot on the correct line but not the intended distance. As a result, seven items were retained for subsequent factor analyses (see Table 1 for item content).

Factor Structure, Reliability and Concurrent Validity. To determine the factor structure of the scale, an EFA was conducted on the seven items. This analysis was performed using adjusted principal components analysis and oblimin rotation. Factors with eigenvalues greater than one were extracted, and primary loadings of .40 and above were considered interpretable, whereas secondary loadings of .32 and above were viewed as cross-loadings. This analysis resulted in the emergence of a single factor, with an eigenvalue of 3.77 and accounting for 46.4% of the variance in the seven items.

The unidimensionality of the scale indicated in the EFA was then assessed using CFA. Specification of a single-factor model resulted in excellent model fit, χ^2 (12) = 11.71, p >.05, CFI = 1.000, RMSEA = .000, SRMR = .029. Correlated errors were specified between two item pairs (i.e., drive the ball on the desired line/hit long irons on the desired line; chip the ball on the desired line/pitch the ball on the desired line). The requirement of these specifications was indicated during initial model testing by the Lagrange Multiplier

Test results. The similarities between the skills in each of the item pairs, and the statistical significance of the correlated errors across all three datasets (see later analyses) provide support for the appropriateness of their specification in model testing (Klein, 2009). Table 1 presents the items, standardized factor loadings, and error variances for the final seven items. The magnitudes of all factor loadings were good based on the recommendations of Comrey and Lee (1992; >.55 = good; .45 to .55 = fair; .32 to .45 = poor; < .32 = not interpretable).

Internal reliability was estimated using the composite reliability coefficient (Raykov, 1997). The composite reliability coefficient calculated using the seven items was .90, demonstrating excellent internal reliability. To establish evidence for the scale's concurrent validity, we then computed the correlation between task self-efficacy and athletes' perceptions of coaching motivation efficacy within SPSS using aggregate scores for both variables. The presence of a significant weak-to-moderate positive relationship ($r = .21$, $p < .05$) between the two variables supported the concurrent validity of the newly developed scale, as conceptually one would expect athletes who have greater confidence in their coach's ability to develop their psychological abilities to have higher levels of task self-efficacy (see Feltz et al., 1999; Boardley et al., 2008).

Brief Discussion

Our primary aim in Study 1 was to develop and provide preliminary validity evidence for an instrument designed to assess self-efficacy in golf. In doing so, we sought to address several aspects of validity outlined in Messick's (1995) unified view of construct validity. Messick contended that the content aspect of validity relates to the relevance, representativeness, and technical quality of items, and we accounted for this issue through the use of expert feedback during item development. Importantly, our analyses also provided evidence relating to the structural aspect of validity for the final seven-item instrument. More specifically, we (a) observed support for the intended unidimensional factor structure of the measure, (b) obtained factor loadings that were all classified as ‘good’ according to Comrey and Lee’s (1992) guidelines, and (c) obtained an acceptable composite reliability (i.e., internal consistency) estimate for the measure. Finally, we provided evidence of what Messick would term the ‘external’ aspect of validity (e.g., concurrent validity) through the positive association with athletes’ ratings of their coach’s motivation efficacy. These findings support the appropriateness of this instrument for the assessment of self-efficacy in golf. However, construct validation is an iterative process, and so our aim in Study 2 was to further explore the measurement properties of this instrument with a separate sample, whilst also considering important substantive questions relating to the variables that may align with (i.e., predict, and be predicted by) self-efficacy in golf.

Study 2

Having developed and validated the instrumentation to assess task self-efficacy in golf in Study 1, in Study 2 we sought to address our substantive research aims. More specifically, we investigated whether: (a) athletes’ perceptions of their coach’s motivation efficacy predicted athletes’ pre-competition task self-efficacy, (b) competitive performance predicted pre- to post-competition changes in task self-efficacy, (c) competitive performance predicted pre- to post-competition changes in positive and negative affect, and (d) whether any predictive effects of competitive performance on pre- to post-competition changes in positive and negative affect were mediated by pre- to post-competition changes in task self-efficacy.

Based upon the literature reviewed, we proposed the following study hypotheses. First, players’ perceptions of their coach’s motivation efficacy would positively predict task self-efficacy (Boardley et al., 2008; Feltz et al., 1999). Second, performance would positively predict pre- to post-round changes in task self-efficacy (Bandura, 1997; Feltz et al., 2008). Third, performance would have positive and negative predictive effects, respectively, on pre- to post-round changes in positive and negative affect (Bandura, 1997).

Finally, the predictive effects of performance on pre- to post-round changes in positive and negative affect would be mediated by pre- to post-round changes in task self-efficacy (Bandura, 1997; Martin, 2002, 2008; Treasure et al., 1996).

Method

Participants. Participants were male (*n* = 195) and female (*n* = 5) competitive golfers playing in the Midlands region of England. Athletes ranged in age from 16.08 to 77.75 years (*M* = 36.07, *SD* = 18.19), had a golf handicap of between -3.00 and +19.00 (*M* = 7.14, *SD* = 6.73), practiced/competed at golf for an average of 9.65 hours/week (*SD* = 6.95), with an average of 0.92 of those hours (*SD* = 0.99) being coached each week. Participants' current highest level of competition included recreational (*n* = 88), local (*n* = 30), university (*n* = 33), regional (*n* = 13), state (*n* = 1), national (*n* = 31), and international (*n* = 4) levels. All players were coached for at least one hour per month.

Measures

Task Self-Efficacy and Coaching Motivation Efficacy. The instruments used in Study 1 to measure these constructs were again employed here. We again performed CFA on the newly developed task self-efficacy measure to confirm its unidimensionality in a separate sample. Specification of the same model as specified in Study 1 again resulted in excellent model fit, χ^2 (12) = 16.62, *p* >.05, CFI = 0.979, RMSEA = .044, SRMR = .051, and standardized factor loadings and error variances for the seven items can be found in Table 1. The magnitudes of six factor loadings were good, and one was fair (see Comrey & Lee, 1992).

Positive and Negative Affect. The frequency that players experienced positive and negative affect whilst playing golf was assessed using a nine-item scale developed by Diener and Emmons (1984). The positive affect scale comprised four items (i.e., happy, pleased, joyful, enjoyment/fun), and the negative affect scale contained five items (i.e., unhappy, angry/hostile, frustrated, anxious, depressed). When completing the pre-competition affect measure, players were asked to report how often they had experienced each of the emotions in the time leading up to playing golf that day, whereas post-competition they were requested to report on the emotions they felt whilst playing the final hole. As such, pre-competition, participants responded to the stem "So far today, I have felt…", whereas post-competition the stem was "Whilst playing the last hole, I felt…". On both occasions players indicated their answers on a Likert scale ranging from 1 (*not very often*) to 7 (*all the time*). The internal reliability of this measure has been supported in previous sport research (e.g., Ebbeck & Weiss, 1998).

Performance. Performance was calculated as the inverse of the ratio between each player's net score and the mean score for all participants who played in the same competition. This provided scores that were directly comparable regardless of competitive venue, as a score of -1 represented a net score equivalent to the mean net score for participants from the same competition, regardless of which competition a particular participant had played in. This also meant our performance score accounted for the difficulty of the particular golf course on the specific day of competition, as it is assumed competition-specific elements such as course difficulty, course condition and weather would be reflected in the mean score for each particular competition. Finally, the inverse ratio was calculated so that higher scores represented higher levels of performance.

Procedures**.** In general, the procedures for Study 2 were similar to those for Study 1. However, procedures relating to recruitment and data collection did differ from those in Study 1. More specifically, to recruit participants competition organizers at golf clubs in the target region were contacted by email and/or telephone by one of two trained research assistants. Organizers were informed of the nature of the study and requests were made for the opportunity to invite players from their competitions to participate. For consenting organizers, arrangements were made for one of the research assistants to attend their events. In total, four competitions were used for data collection, with the number of participants for any one competition ranging from 40 to 67. Data collection occurred at two time points for each of the competitions visited, once prior-to- and once post-competition. Players were first approached immediately after they had signed in, when they were informed about the nature of the investigation, what participation involved, and the rights of study participants. Similar to Study 1, they were provided with the opportunity to ask any questions and informed (verbally and in writing) that their coaches and opponents would not be made aware of their responses. Those deciding to participate then provided their informed consent, before completing the pre-competition questionnaire pack privately and individually; this took place within an hour of each individual's tee-off time. The pre-competition questionnaire pack contained the scales assessing task self-efficacy, coaching motivation efficacy, and positive and negative affect. Following completion of their competition, participants completed the post-competition questionnaire pack privately and individually, immediately after they handed in their score card; on all occasions this occurred within an hour of completing the competition. The post-competition questionnaire pack contained the same scales as those in the pre-competition pack, with the exception of the coaching motivation efficacy measure which was not included.

Results

Data Screening, Descriptive Statistics, Scale Reliabilities, and Correlations.

There were no missing data points in the 200 cases. Normality of all items and study variables was evidenced by skewness and kurtosis values of <|2|. Descriptive statistics, scale reliabilities, and correlations between primary variables are presented in Table 2. As can be seen in Table 2, all scales demonstrated very good levels of reliability, and a number of significant correlations were observed. Most notably, coaching motivation efficacy had a moderate positive alignment with pre-competition task self-efficacy, performance had a strong positive association with pre- to post-competition changes in task self-efficacy, and pre- to post-competition changes in task self-efficacy had strong positive and negative relationships, respectively, with pre- to post-competition changes in positive and negative affect.

Structural Equation Modeling. To investigate the research questions described in the study aims, SEM was employed using the two-step approach recommended by Anderson and Gerbing (1988). The first step in this approach involves testing the measurement model, that is, the posited relationships of the observed variables to their relevant latent constructs, with the latent constructs allowed to intercorrelate. Specifying the appropriate measurement model using the 14 items assessing perceived coaching motivation efficacy and pre-competition task self-efficacy with the Study 2 data resulted in an excellent model fit, χ^2 (74) = 94.89, p = >.05; CFI = .963; RMSEA = .038; SRMR = .065. We then proceeded to the second step in Anderson and Gerbing's approach, which involves testing a model incorporating the hypothesized structural pathways. The data displayed a very good fit for the model, χ^2 (145) = 182.55, p = .02; CFI = .958; RMSEA = .036; SRMR = .072. As shown by the standardized coefficients (see Figure 1 and Table 3), perceived coaching motivation efficacy had a moderate-to-strong positive effect on pre-competition task self-efficacy which in turn was an insignificant predictor of performance. Importantly, performance had a strong positive effect on pre- to post-competition changes in task self-efficacy, which then had moderate-to-strong positive and negative effects, respectively, on pre- to post-competition changes in positive and negative affect. The model accounted for 34% of the variance in pre-competition task self-efficacy, 37% of the variance in pre- to post-competition changes in task self-efficacy, and 25% and 26%, respectively, of the variance in pre- to post-competition changes in positive and negative affect.

To determine whether pre- to post-competition changes in task self-efficacy mediated effects of performance on pre- to post-competition changes in positive and negative affect, we requested the decomposition of model effects into direct, indirect, and total effects (Bollen, 1987). For pre- to post-competition changes in positive affect, the total, direct, and indirect effects of performance were .38 ($p < .05$), .18 ($p < .05$), and .20 ($p < .05$), respectively; the percentage of the total effect mediated by pre- to post-competition changes in task self-efficacy was 53%. For pre- to post-competition changes in negative affect, the total, direct, and indirect effects of performance were -.34 ($p < .05$), -.11 ($p > .05$), and -.23 ($p < .05$), respectively; the percentage of the total effect mediated by pre- to post-competition changes in task self-efficacy was 68%.

To test the significance of mediation, we utilized the distribution of products test of MacKinnon, Lockwood, Hoffman, West, and Sheets (2002), who describe this as an effective test of mediation due to its greater retention of statistical power and maintenance of a more accurate Type I error rate in comparison to other mediation tests. This test involves converting the two parameter estimates forming the mediated relationship into z-scores and comparing the product of these two z-scores against normative significance criteria. The mediated effects through pre- to post-competition changes in task self-efficacy between performance and pre- to post-competition changes in positive affect ($z_\alpha z_\beta = 41.94$, $p < .01$) and pre- to post-competition changes in negative affect ($z_\alpha z_\beta = 41.09$, $p < .01$) were significant, indicating that pre- to post-competition changes in task self-efficacy partially mediated effects of performance on both types of affect.

Brief Discussion

Our aims in Study 2 were to build on the methodological advancements achieved in Study 1, and to explore support for a series of substantive hypotheses regarding the inter-relationships between efficacy perceptions, performance, and affect. Psychometric analyses provided further support for the validity and reliability of the newly-developed self-efficacy instrument. That is, we observed evidence of structural and external aspects of validity and reliability by demonstrating the unidimensionality and internal consistency of scores derived from the instrument, as well as through anticipated correlations with theoretically-related variables (e.g., perceptions of coach's motivation efficacy). In terms of the predictive relationships examined in Study 2, whilst controlling for handicap, players reported greater confidence in their own ability when they believed more strongly in their coach's ability to affect the psychological skills and states of athletes (see Boardley et al., 2008; Lent & Lopez, 2002). Our analyses also demonstrated that effective performance was positively (and directly) related to desirable changes in players' pre-to-post-round self-efficacy and positive affect scores. That is, performing better was associated with more favorable post-competition (relative to pre-competition) golf confidence and increased positive affect.

Finally, in light of the theorized relations between self-efficacy and affective processes (Bandura, 1997), it was also interesting that self-efficacy change acted as a mechanism supporting indirect relations between performance and change on both affective variables. To illustrate, we observed that effective performance was positively associated with change in self-efficacy, which in turn predicted improved positive affect and reduced negative affect from pre-to-post-competition. Despite these noteworthy relationships, it is worth noting that we measured only broad affective dimensions (i.e., positive, negative), so our insight into specific emotional states was limited. Accordingly, Study 3 was designed to enable us to obtain a more nuanced insight into the ways in which specific emotions may fluctuate according to in-competition performance and change in self-efficacy.

Study 3

In Study 2 we found support for our hypotheses relating to the interrelationships between performance, pre- to post-round changes in task self-efficacy, and pre- to post-round changes in positive and negative affect. Although this study made an important contribution to research in this area, the findings of this study could be extended through the investigation of specific emotions as opposed to assessing general indices of affect as in Study 2. As such, in Study 3 we sought to replicate and extend the findings from Study 2 by testing an equivalent hypothetical model in which positive and negative affect were replaced with individual emotions representing these two dimensions of affect. For this purpose, we select two of the five emotions that Jones, Lane, Bray, Uphill, and Catlin (2005) identified as being particularly relevant to sport performance: excitement and anxiety. Moreover, given the multidimensional nature of anxiety (Jones et al., 2005), we investigated three dimensions of this construct: concentration disruption, somatic anxiety, and worry. As such, our main aims for Study 3 were to establish whether: (a) the generic findings from Study 2 could be replicated in a separate sample, and (b) the specific findings from Study 2 relating to changes in positive and negative affect would be supported when these general indices of affect were replaced with specific emotions.

Method

Participants. Participants were male (*n* = 200) and female (*n* = 12) competitive golfers playing in the Midlands and Southern regions of England. Athletes ranged in age from 18.00 to 73.00 years (*M* = 23.41, *SD* = 9.27), had a golf handicap of between -2.00 and + 24.00 (*M* = 5.51, *SD* = 5.49), practiced/competed at golf for an average of 7.39 hours/week (*SD* = 5.12), with an average of 2.42 of those hours (*SD* = 2.33) being coached each week. Participants' current highest level of competition included recreational (*n* = 24), local (*n* = 38), university (*n* = 49), regional (*n* = 63), state (*n* = 24), national (*n* = 7), and international (*n* = 7) levels. All players were coached for at least one hour per month.

Measures

Task Self-Efficacy, Coaching Motivation Efficacy and Performance. These constructs were assessed in the same way as in Study 2. To provide further evidence for the unidimensionality of the newly developed task self-efficacy measure, we again performed CFA. Specification of the same model as specified in Studies 1 and 2 again resulted in excellent model fit, χ^2 (12) = 11.54, *p* = .48, CFI = 1.000, RMSEA = 0.000, SRMR = .033, and standardized factor loadings and error variances for the seven items can be found in

Table 1. The magnitudes of four factor loadings were good, one was fair, and two were on the border between poor and fair (see Comrey & Lee, 1992).

Anxiety. The Sport Anxiety Scale-2 (Smith, Smoll, Cumming, & Grossbard, 2006) was used to measure state concentration disruption, somatic anxiety, and worry before and after competing. Concentration disruption (e.g., "It is hard to concentrate on the competition"), worry (e.g., "I'm worrying that I will not play well"), and somatic anxiety (e.g., "My body feels tense") were measured with five items each, with responses made using a 4-point Likert scale ranging from 1 (*not at all*) to 4 (*very much*). Pre-competition, participants indicated how they felt at that moment in time, whereas post-competition they reported how they felt during the last hole they played that day. All three subscales have shown evidence of construct and factorial validity in previous studies, as well as very good internal reliability (Smith et al., 2006).

Excitement. Excitement was measured using the excitement subscale of the Sport Emotion Questionnaire (Jones et al., 2005). The stem "I feel..." preceded four items (e.g., "exhilarated", "excited"), with responses made using a 5-point Likert scale with anchors of 1 (*not at all*) and 5 (*extremely*). Pre-competition, participants indicated how intensely they felt the emotion, at that moment, in relation to the upcoming competition, whereas post-competition they reported the intensity of each emotion during the last hole they played that day. This subscale has demonstrated construct validity (Jones et al., 2005) and shown adequate internal reliability when administered before team-sport matches (Allen, Jones, & Sheffield, 2009).

Procedures

General procedures for this study were identical to those of Study 2. For this study, five competitions were used for data collection, with the number of participants for any one competition ranging from 27 to 58. Specific procedures relevant to this study only relate to the contents of the pre- and post-competition questionnaire packs. More specifically, the pre-competition pack contained the scales assessing task self-efficacy, coaching motivation efficacy, excitement, and anxiety, whereas the post-competition pack contained the same scales as the pre-competition pack but with the coaching motivation efficacy scale omitted.

Results

Data Screening, Descriptive Statistics, Scale Reliabilities, and Correlations. There were no missing data points in the 212 cases. Normality of all items and study variables was evidenced by skewness and kurtosis values of <|2|. Descriptive statistics, scale reliabilities, and correlations between the study variables are presented in Table 2. As shown in Table 2, all scales demonstrated very good levels of reliability, and numerous significant correlations were observed. In particular, coaching motivation efficacy had a moderate-to-strong positive relationship with pre-competition task self-efficacy, performance had a moderate-to-strong positive association with pre- to post-competition changes in task self-efficacy, and pre- to post-competition changes in task self-efficacy had moderate positive and negative relationships, respectively with pre- to post-competition changes in excitement and concentration disruption and weak-to-moderate negative alignments with somatic anxiety and worry.

Structural Equation Modeling. To achieve the study aims, we employed SEM using the same approach as in Study 2. The first step again involved testing the measurement model. Similar to Study 2, specification of the measurement model resulted in an excellent model fit, χ^2 (74) = 79.68, p = .31; CFI = .993; RMSEA = .019; SRMR = .052. Subsequent specification of the structural model incorporating the hypothesized structural pathways again displayed a very good fit, χ^2 (178) = 220.90, p = .02; CFI = .961; RMSEA = .034; SRMR = .063. As shown by the standardized coefficients (see Figure 2 and Table 3), perceived coaching motivation efficacy had a strong positive effect on pre-competition task self-efficacy, which in turn was an insignificant predictor of performance. Performance had a moderate-to-strong positive effect on pre- to post-competition changes in task self-efficacy, which then had a moderate-to-strong positive effect on excitement, and weak-to-moderate to moderate negative effects on pre- to post-competition changes in concentration disruption, somatic anxiety, and worry. The model accounted for 23% of the variance in pre-competition task self-efficacy, 36% of the variance in pre- to post-competition changes in task self-efficacy, and 13%, 12%, 3% and 7% respectively, of the variance in pre- to post-competition changes in excitement, concentration disruption, somatic anxiety and worry.

To determine whether pre- to post-competition changes in task self-efficacy mediated an effect of performance on pre- to post-competition changes in excitement, concentration disruption, somatic anxiety and worry, we again requested the decomposition of model effects into direct, indirect, and total effects (Bollen, 1987). For pre- to post-competition changes in excitement, the total, direct, and indirect effects of performance were .18 ($p < .05$), .07 ($p > .05$), and .11 ($p < .05$), respectively; the percentage of the total effect mediated by pre- to post-competition changes in task self-efficacy was 61%. For pre- to post-competition changes in concentration disruption, the total, direct, and indirect effects of performance were -.22 ($p < .05$), -.12 ($p > .05$), and -.10 ($p < .05$), respectively; the percentage of the total effect mediated by pre- to post-competition changes in task self-efficacy was 45%. For pre- to post-competition changes in somatic anxiety, the total, direct, and indirect effects of performance were -.07 ($p > .05$), -.01 ($p > .05$), and -.06 ($p < .05$), respectively; the percentage of the total effect mediated by pre- to post-competition changes in task self-efficacy was 86%. For pre- to post-competition changes in worry, the total, direct, and indirect effects of performance were -.12 ($p < .05$), -.03 ($p > .05$), and -.09 ($p < .05$), respectively; the percentage of the total effect mediated by pre- to post-competition changes in task self-efficacy was 75%. To test the significance of mediation, we again utilized the distribution of products test of MacKinnon et al. (2002). The mediated effects through pre- to post-competition changes in task self-efficacy between performance and pre- to post-competition changes in excitement ($z_{\alpha}z_{\beta}$ = 18.83, p <. 01) concentration disruption ($z_{\alpha}z_{\beta}$ = 19.49, p <. 01), somatic anxiety ($z_{\alpha}z_{\beta}$ = 10.83, p <. 01) and worry ($z_{\alpha}z_{\beta}$ = 16.89, p <. 01), were all significant, indicating that pre- to post-competition changes in task self-efficacy partially mediated effects of performance on all four variables.

General Discussion

Continued empirical attention has been directed toward exploring the predictive functions of self-efficacy across various sports (see Feltz et al., 2008). However, relatively little of this work has been devoted to studying the way in which coach-related perceptions and competitive performance may shape one's efficacy judgments prior to and following competition within golf, or to identifying the way in which changes to one's confidence may align with fluctuations in related affective processes in this context. The overarching aim of these three studies was to advance our understanding of self-efficacy in golf, and in doing so, to develop an appropriate instrument that could be used to explore relationships between self-efficacy and theoretically-derived correlates. In the following sections, we consider the most noteworthy and consistent findings that emerged across the studies.

First, in line with validity and reliability evidence presented in studies 1 and 2, data in Study 3 provided further support for the newly-developed measure of self-efficacy. Analyses of the 7-item measurement model and internal consistency in Study 3 again demonstrated evidence of the structural aspect of validity (i.e., factor structure, factor loadings, reliability), and taken together, data from three separate samples across the three studies provided preliminary evidence for the continued use of this measure for the purpose of assessing golfers' confidence in their ability to perform the skills of their sport. In line with the notion that instrument development (and refinement) is a continuous process, though, it is important to continue to examine the psychometric properties of this instrument in the future. For example, given that our samples were predominantly male and drawn from the UK, we were unable to consider issues relating to important generalizability aspects of validity (Messick, 1995). In future, data that allow for invariance analyses (e.g., by gender, nationality) would be worthwhile in demonstrating that measures derived from this instrument operate in a consistent manner across different population groups, as would a more comprehensive assessment of the variables with which scores on this measure align (i.e., broadening the nomological net).

Aside from our methodological focus, and with respect to substantive (i.e., predictive) considerations, it is important to highlight the consistent predictive effect that golfers' perceptions of their coach's motivation efficacy displayed in relation to golfers' task self-efficacy. Not only were these two variables positively related in Study 1, we also observed that perceptions of motivation efficacy were a moderate-to-strong predictor of pre-round task self-efficacy while controlling for player handicap in the structural models in studies 2 and 3. Although this is the first evidence of such a relationship within the sport of golf, this finding is consistent with the literatures relating to coaching efficacy (e.g., Feltz et al., 1999), coach effectiveness (Boardley et al., 2008; Horn, 2008), and interpersonal perceptions (e.g., Lent & Lopez, 2002). Notwithstanding the novel contextual insight provided by these findings, perhaps the most noteworthy aspect of this relationship is that favorable perceptions about one's coach's motivation ability were shown to be important for one's self-efficacy despite relatively infrequent contact between coach and athlete, and the inability for interaction during competition. It is possible that the average durations for coach-athlete relationships in studies 2 and 3 compensated for these factors, in that the longevity of interactions between coach and player provided sufficient opportunities for coaches perceived to be high in motivation efficacy to positively influence their athletes' task self-efficacy despite relatively infrequent contact and lack of interaction during competition. Unfortunately data on the duration of the coach-athlete relationship were not collected in the current studies and we were therefore unable to test this potential explanation. Researchers are encouraged to test this plausible explanation in future work.

Another consistent finding that emerged out of our structural modeling analyses was the positive relationship between performance and pre-to-post-competition changes in task self-efficacy. That is, we observed moderate-to-strong effects in studies 2 and 3 indicating that golfers who performed better reported greater positive change in their self-efficacy (i.e., were relatively more confident in their ability post-competition) across their competitive rounds of golf. The ability to model the effects of objective performance upon self-efficacy change was a strength of the studies presented here, and the predictive relationship broadly supports the agentic principle that individuals play a proactive role in revising their efficacy beliefs in accordance with performance-related information (see Bandura, 1997). It is worth noting, however, that we did not assess players' subjective appraisals of their performance (e.g., "I didn't score great, but I thought I hit the ball ok today"), and so we were unable to determine the way in which one's personal interpretation of one's performance – whether consistent with objective outcomes or not – might contribute to revised self-efficacy judgments alongside objective markers.

Finally, in studies 2 and 3 we also investigated relationships between performance and pre-to-post-competition changes in affect, and analyses provided evidence of both direct and indirect associations. In terms of direct relationships, performance positively predicted change in positive affect in Study 2 (i.e., those who performed well experienced greater increases in positive affect across-competition). The improved positive emotional profile that we observed in Study 2 was consistent with existing reports regarding the general positive outcomes of effective performance (Hanin, 2007); however, we are not aware of any previous work that has specifically considered the way in which in-competition performance may predict *fluctuations* in pre-to-post-competition emotions. Moreover, not only was performance directly associated with improvements in this outcome, it also accounted for changes in affective states indirectly in studies 2 and 3, through improvements in pre-to-post-competition self-efficacy. To illustrate, it emerged that effective performance predicted elevated confidence post- (relative to pre-) competition, and in turn, this elevation in self-efficacy predicted increased positive and reduced negative affect (Study 2), as well as improved excitement and decrements in discrete anxiety dimensions (Study 3). The specific pathways that contributed to these predictive effects (i.e., performance-to-self-efficacy, self-efficacy-to-emotion) were consistent with principles of self-efficacy theory (Bandura, 1997), and taken together, these indirect relations support the notion that self-efficacy may act as a cognitive filter that contributes to the regulation of one's emotional responses pre-to-post-competition. Given the approach- and avoidance-related behavioral implications associated with emotional experiences such as those assessed in studies 2 and 3 (cf. Hanin, 2007), it would be worthwhile to adopt a longitudinal approach and examine the distal (i.e., longer-term) outcomes that align with these emotional responses. For example, researchers might consider how changes in these affective indices contribute to post-competition interpretations in the days following performance, as well as one's engagement in practice and anticipatory (e.g., threat, challenge) appraisals regarding future competition.

In contrast with evidence suggesting task self-efficacy beliefs may contribute to effective sport performance (e.g., Beauchamp et al., 2002; Moritz et al., 2000), there was no effect of pre-competition self-efficacy on performance in Study 2 or 3. One possible explanation for this relates to the lack of close temporal proximity between our assessments of efficacy and performance. According to Bandura (1997), the strength of the association between efficacy judgements and performance is expected to be strongest when the two are measured in close temporal proximity. However, in the current research the temporal proximity between the two assessments was not particularly close, and the time interval between assessment of self-efficacy and the commencement of performance could have allowed for engagement in potential efficacy-influencing experiences such as warm-up activities that may have weakened or strengthened self-efficacy beliefs before performance commenced (cf. Fransen et al., 2015). Further, potential hole-by-hole fluctuations in efficacy that our methodology did not account for may have heightened the discordance between our assessment of pre-round self-efficacy and performance, especially as competitive performance progressed. Consistent with this possibility, Fransen et al. (2015) found that pre-match collective efficacy failed to predict first-half performance in soccer players, but that half-time collective efficacy predicted second-half performance. Thus, when the time lapse between efficacy and performance assessments was reduced – and potential intervening experiences (e.g., pre-match speech, warm-up) were not present – collective efficacy was found to predict subsequent performance. It would therefore be interesting in future work to investigate how hole-by-hole efficacy assessments relate to subsequent performance to address these potential issues, and examine the possible impact of temporal proximity on the efficacy-performance relationship.

Another possible explanation relates to the within-person level of analysis in the current study. Importantly, a recent meta-analysis of such research designs found that – consistent with the current findings – self-efficacy often does not significantly predict performance in within-person designs (e.g., Sitzman & Yeo, 2013). Further, even when controlling for potential moderators (e.g., goal setting), Sitzman and Yeo (2013) found past performance to be a stronger predictor of self-efficacy than self-efficacy was of performance. This too is consistent with the present findings, in that overall performance was a strong predictor of pre-to-post round changes in self-efficacy, whilst pre-round self-efficacy was an insignificant predictor of performance. Further, Beattie, Fakehy, and Woodman (2014) examined whether time spent on the task and task complexity moderated the relationship between self-efficacy and performance in golf putting. Importantly, this work showed that the relationship between the two variables strengthened as time learning the task increased, and through variation of task difficulty. It is therefore possible that the predictive effect of self-efficacy on performance in the current work was affected by a moderator variable (e.g., effort) that we did not account for in our analyses. Clearly, these explanations are speculative in nature, and we encourage future work that identifies the mechanism/s underpinning the self-efficacy – performance disconnect that we observed.

The findings described in studies 1 to 3 contribute novel methodological and substantive insight to our knowledge of self-efficacy in this context. However, there are important limitations and associated future research directions that should be acknowledged. First, although we observed consistent support for the validity of measures derived from the self-efficacy instrument (e.g., structural properties, internal consistency), it is worth noting that this instrument only assessed players' perceptions of their technical competencies. That is, players were not requested to rate their confidence in relation to psychological (e.g., remaining focused at all times), strategic (e.g., make correct decisions), or physical (e.g. being physically fit enough) requirements. Specific reference was not made to making difficult shots (e.g., shots from the rough or hazards) either. As such future researchers may wish to broaden the scope of this instrument to assess a wider range of skills relevant to optimal golf performance. Moreover, the fact that players within each study did not all participate in the same competition may have induced some unintended noise in playing conditions that contributed to performance variation. Although the non-experimental design did not allow for competition to be tightly controlled, and despite accounting for venue-specific influences (i.e., by creating a normed score relative to the mean of one's opponents on the day of competition), there may have been situational differences that gave rise to variance in performance conditions (e.g., different playing partners). In order to enhance internal validity in future investigations, researchers may adopt more tightly controlled designs that eliminate external influences (e.g., all players competing at the same venue).

With respect to other ways in which this work can be extended in future, investigators may wish to obtain repeated assessments of performance and self-efficacy, rather than the single-competition measurements that were recorded in this work.

Longitudinal measurements across multiple competitions (or multiple days of a single competition) would allow for the investigation of self-efficacy – performance spirals and enable researchers to study reciprocal relationships between players' confidence and achievement levels (e.g., Feltz, Chow, & Hepler, 2008). In addition, given that players' task self-efficacy beliefs were greater when they believed in their coach's ability to prepare athletes psychologically, it may be useful to draw from the interpersonal expectations literature (Lent & Lopez, 2002) to examine the specific coach behaviors (and/or athlete dispositions and characteristics) that give rise to favorable impressions of one's coach's motivation efficacy. Similarly, future work might explore whether players' perceptions of their coaches on other relevant dimensions of coaching efficacy (e.g., technique efficacy; see Boardley et al., 2008) explain additional variance in players' task self-efficacy in golf when assessed alongside perceptions of motivation efficacy.

In conclusion, despite the sustained research attention that has been directed toward self-efficacy in sport, this investigation provided insight into a number of previously unexplored self-efficacy related phenomena. Data presented within these three studies provided (a) the first evidence of the role of coach-related perceptions with respect to task self-efficacy in a golf setting, (b) preliminary support for the validity and reliability of a new golf self-efficacy instrument, and (c) insight into the way in which competitive performance may underpin changes in one's self-efficacy perceptions and affective states. These findings underscore the notion that self-efficacy (and related affective) judgments may be revised in line with one's competitive performance, and present a range of interesting directions relating to the longer-term consequences of these post-competition appraisals.

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Table 1

Factor Loadings (FL) and Error Variances (EV) for Final Task Self-Efficacy Items (Study 1 n = 197; Study 2 n = 200, Study 3 n = 212)

Item Name	Task Self-Efficacy FL (EV)		
Consistently…	Study 1	Study 2	Study 3
drive the ball on the desired line	.57 (.82)	.47 (.88)	.44 (.90)
hit long irons on the desired line	.60 (.80)	.58 (.82)	.61 (.79)
hit short irons on the desired line	.71 (.71)	.78 (.62)	.71 (.71)
chip the ball on the desired line	.74 (.67)	.59 (.81)	.62 (.78)
pitch the ball on the desired line	.74 (.68)	.62 (.79)	.63 (.78)
play bunker shots on the desired line	.72 (.70)	.64 (.77)	.44 (.90)
putt the ball on the desired line	.60 (.80)	.63 (.78)	.51 (.86)

Note. All values significant, $p < .05$

Table 2

Descriptive Statistics, Scale Reliabilities, and Correlations for Study 2 (N = 200) and Study 3 (N = 212)

Variable	*M*	*SD*	Range	1	2	3	4	5	6	7	8
						Study 2					
1. Motivation Efficacy	4.11	0.59	1.57 to 5.00	(.90)							
2. Task Self-Efficacy Pre	3.53	0.62	1.86 to 5.00	.29**	(.89)						
3. Performance	-1.00	0.07	-1.22 to -0.87	-.01	-.11	(-)					
4. Pre-Post Δ Task Self-Efficacy	-0.32	0.65	-2.86 to 1.14	-.14*	-.29**	.54**	(.89/.92)				
5. Pre-Post Δ Positive Affect	-0.54	1.29	-4.25 to 4.00	-.22**	.01	.38**	.48**	(.89/.92)			
6. Pre-Post Δ Negative Affect	0.59	1.33	-3.20 to 5.40	.21**	.10	-.35**	-.50**	-.62**	(.89/.89)		
						Study 3					
1. Motivation Efficacy	3.92	0.56	1.86 to 5.00	(.90)							
2. Task Self-Efficacy Pre	3.54	0.54	2.14 to 5.00	.41**	(.86)						
3. Performance	-1.00	0.09	-1.26 to -0.76	.01	-.04	(-)					
4. Pre-Post Δ Task Self-Efficacy	-0.30	0.69	-4.00 to 1.14	-.18**	-.43**	.37**	(.86/.88)				
5. Pre-Post Δ Excitement	-0.29	0.96	-3.25 to 3.25	-.02	-.10	.19**	.35**	(.88/.93)			
6. Pre-Post Δ Concentration Disruption	0.17	0.85	-3.00 to 2.80	.02	.17*	-.23**	-.33**	-.06	(.88/.92)		
7. Pre-Post Δ Somatic Anxiety	-0.05	0.70	-3.00 to 2.00	-.02	.17*	-.07	-.18**	.13	.52**	(.89/.90)	
8. Pre-Post Δ Worry	-0.07	0.83	-3.00 to 2.60	.07	.30*	-.12	-.26**	.03	.54**	.65**	(.92/90)

Note. Composite reliability coefficients are presented on the diagonal with pre-/post-competition values presented for change scores. * *p* <.05; ** *p* <.01

Table 3

Standardized Total, Direct, and Indirect Effects for Model Testing in Study 2 (N = 200) and Study 3 (N = 212)

Relationship	Study 2 Model Effects			Study 3 Model Effects		
	Total	Direct	Indirect	Total	Direct	Indirect
Handicap → Task SE	**-.46**	**-.46**	-	-.14	-.14	-
Motivation Efficacy → Task SE	**.36**	**.36**	-	**.46**	**.46**	-
Handicap → Performance	.04	-	.04	.01	-	.01
Motivation Efficacy → Performance	-.03	-	-.03	-.02	-	-.02
Task SE → Performance	-.08	-.08	-	-.04	-.04	-
Handicap → Δ Task SE	**.15**	-	**.15**	.07	-	.07
Motivation Efficacy → Δ Task SE	**-.12**	-	**-.12**	**-.23**	-	**-.23**
Task SE → Δ Task SE	**-.33**	**-.29**	-.04	**-.49**	**-.48**	-.01
Performance → Δ Task SE	**.52**	**.52**	-	**.35**	**.35**	-
Handicap → Δ Positive Affect	.06	-	.06	-	-	-
Motivation Efficacy → Δ Positive Affect	-.05	-	-.05	-	-	-
Task SE → Δ Positive Affect	**-.14**	-	**-.14**	-	-	-
Performance → Δ Positive Affect	**.38**	**.18**	**.20**	-	-	-
Δ Task SE → Δ Positive Affect	**.38**			-	-	-
Handicap → Δ Negative Affect	-.07	-	-.07	-	-	-
Motivation Efficacy → Δ Negative Affect	.06	-	.06	-	-	-
Task SE → Δ Negative Affect	**.15**	-	**.15**	-	-	-
Performance → Δ Negative Affect	**-.33**	-.11	**-.22**	-	-	-
Δ Task SE → Δ Negative Affect	**-.44**	**-.44**	-	-	-	-
Handicap → Δ Excitement	-	-	-	.02	-	.02
Motivation Efficacy → Δ Excitement	-	-	-	-.08	-	**-.08**
Task SE → Δ Excitement	-	-	-	**-.16**	-	**-.16**
Performance → Δ Excitement	-	-	-	**.18**	.07	**.11**
Δ Task SE → Δ Excitement	-	-	-	**.33**	**.33**	-
Handicap → Δ Conc. Disruption	-	-	-	-.02	-	-.02
Motivation Efficacy → Δ Conc. Disruption	-	-	-	.07	-	**.07**
Task SE → Δ Conc. Disruption	-	-	-	**.15**	-	**.15**
Performance → Δ Conc. Disruption	-	-	-	**-.22**	-.12	**.10**
Δ Task SE → Δ Conc. Disruption	-	-	-	**-.23**	**-.23**	-
Handicap → Δ Somatic Anxiety	-	-	-	-.01	-	-.01
Motivation Efficacy → Δ Somatic Anxiety	-	-	-	.04	-	.04
Task SE → Δ Somatic Anxiety	-	-	-	.09	-	**.09**
Performance → Δ Somatic Anxiety	-	-	-	-.07	.00	**-.07**
Δ Task SE → Δ Somatic Anxiety	-	-	-	**-.18**	**-.18**	-
Handicap → Δ Worry	-	-	-	-.02	-	-.02
Motivation Efficacy → Δ Worry	-	-	-	.06	-	**.06**
Task SE → Δ Worry	-	-	-	**.13**	-	**.13**
Performance → Δ Worry	-	-	-	**-.12**	-.03	**-.09**
Δ Task SE → Δ Worry	-	-	-	**-.20**	**-.20**	-

Note. Values in bold indicate significance at $p < .05$ level

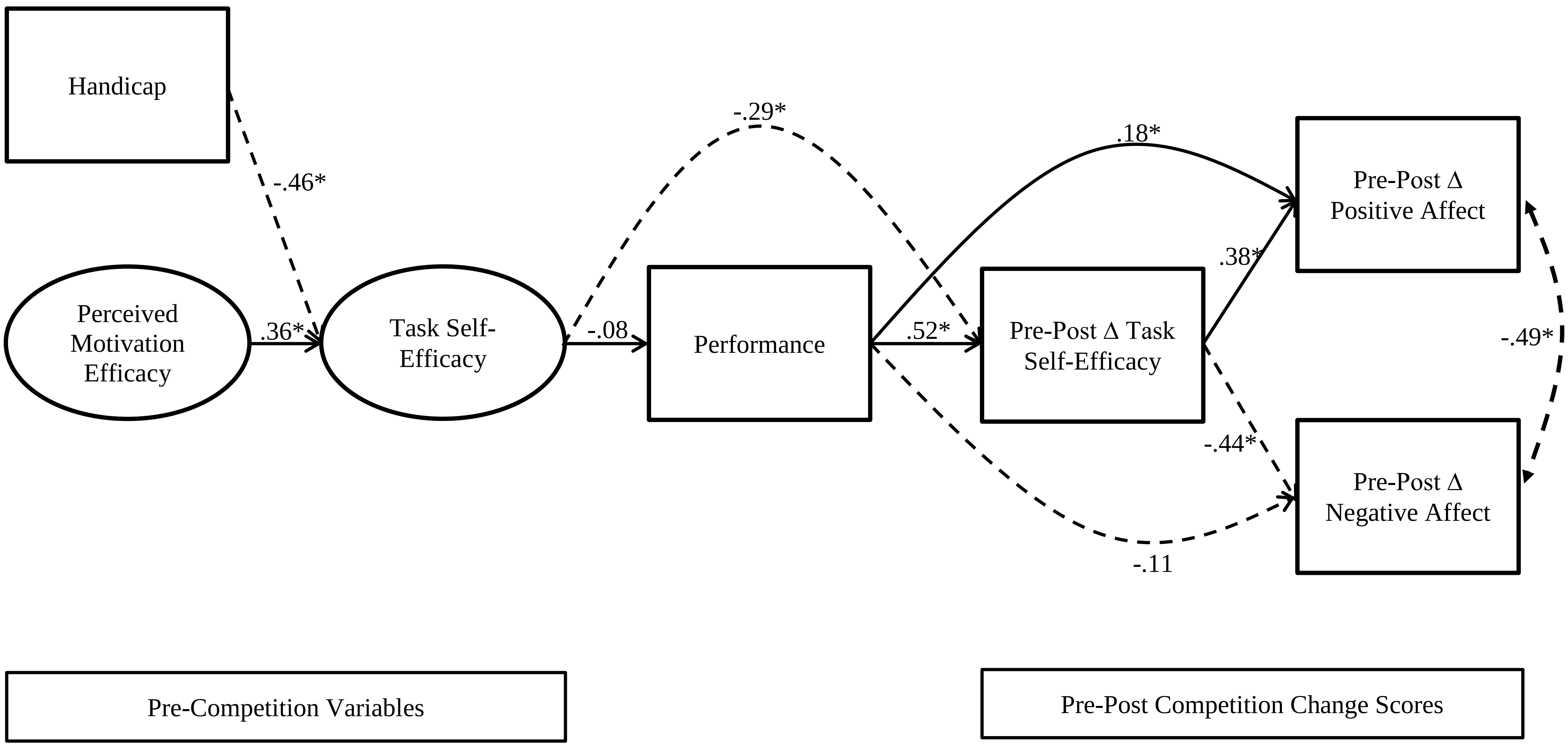

Figure 1. Structural model from Study 2 including parameter estimates.

Note. Hypothesized negative paths are indicated by a dashed line. * *p* <.05

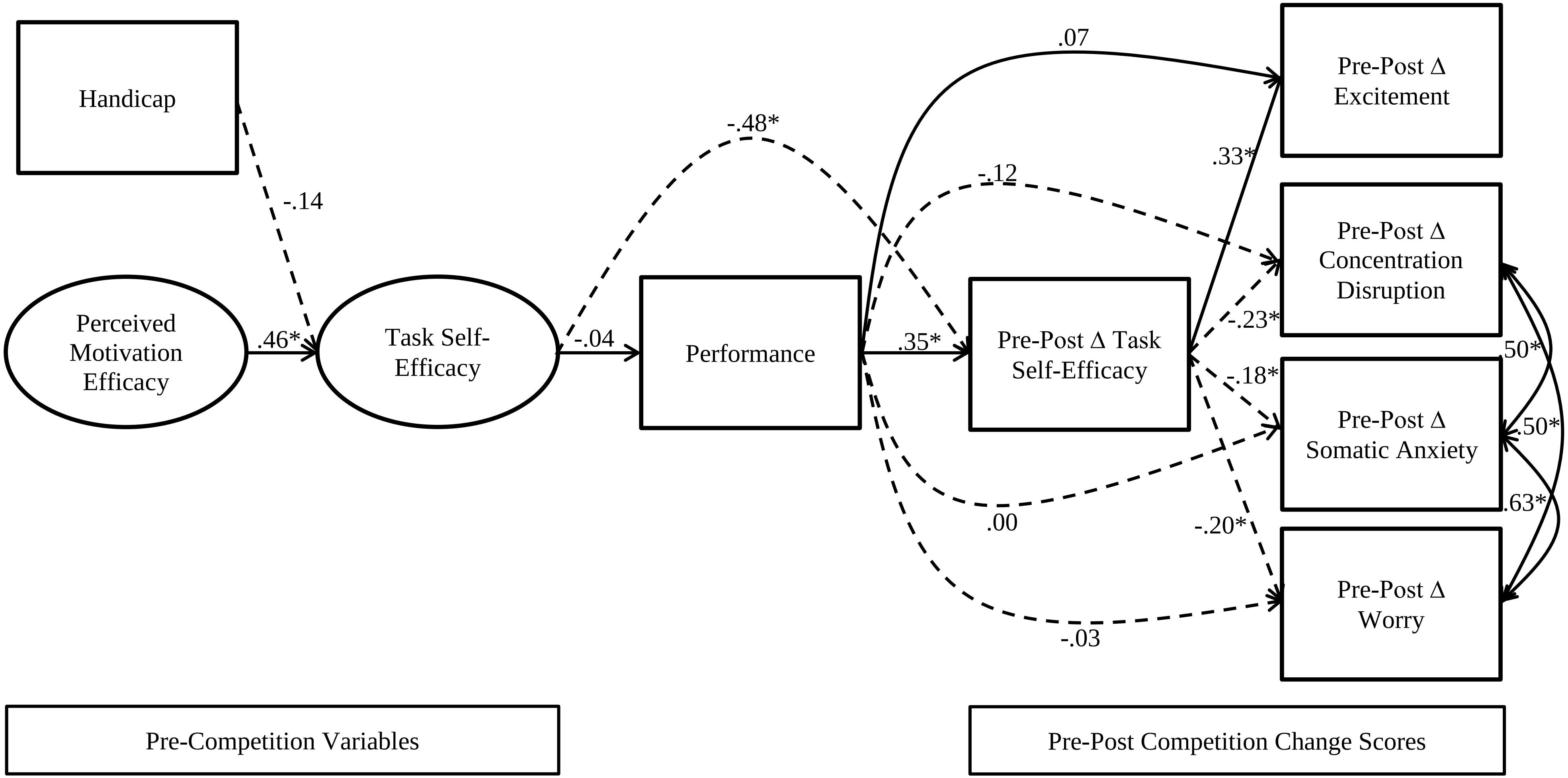

Figure 2. Structural model from Study 3 including parameter estimates.

Note. Hypothesized negative paths are indicated by a dashed line. * *p* <.05