Journal of Sport & Exercise Psychology, 2011, 33, 441-459

Self-Presentation Origins of Choking: Evidence From Separate Pressure Manipulations

Christopher Mesagno,[1] **Jack T. Harvey,**[1]
and Christopher M. Janelle[2]
[1]University of Ballarat; [2]University of Florida

Whether self-presentation is involved in the choking process remains unknown. The purpose of the current study was to determine the role of self-presentation concerns on the frequency of choking within the context of a recently proposed self-presentation model. Experienced field hockey players ($N = 45$) were randomly assigned to one of five groups (i.e., performance-contingent monetary incentive, video camera placebo, video camera self-presentation, audience, or combined pressure), before taking penalty strokes in low- and high-pressure phases. Results indicated that groups exposed to self-presentation manipulations experienced choking, whereas those receiving motivational pressure treatments decreased anxiety and increased performance under pressure. Furthermore, cognitive state anxiety mediated the relationship between the self-presentation group and performance. These findings provide quantitative support for the proposed self-presentation model of choking, while also holding implications for anxiety manipulations in future sport psychology research.

Keywords: impression management, anxiety, paradoxical performance, field hockey

Athletes often experience intense competitive anxiety as a result of the extraordinary pressures that accompany performance in elite sport settings. Competitive sport anxiety reflects an individual's tendency to perceive threat and experience pressure in competition (Janelle & Gamble, in press; Martens, 1977; Martens, Vealey, & Burton, 1990), which may originate from many different sources that include social scrutiny from coaches, players, spectators, and the media. It is not surprising then that an increase in anxiety may lead to performance decrements (Baumeister, 1984; Masters, 1992) and choking under pressure (i.e., choking). Despite continued debate concerning the specifics of the definition and its respective distinguishing characteristics, there is general consensus that choking (in

Christopher Mesagno and Jack T. Harvey are with the School of Human Movement & Sport Sciences, University of Ballarat, Ballarat, Victoria, Australia. Christopher M. Janelle is with the Department of Applied Physiology and Kinesiology, University of Florida, Gainesville, FL.

sports contexts) includes a demonstration of skilled performance, an increase in anxiety under perceived pressure, and substandard performance under pressure (e.g., Baumeister, 1984; Beilock & Gray, 2007; Gucciardi, Longbottom, Jackson, & Dimmock, 2010; Mesagno, Marchant, & Morris, 2008).

Existing Choking Models

Empirical (e.g., Baumeister, 1984; Beilock & Carr, 2001; Masters, 1992) and anecdotal (e.g., professional golfers Greg Norman in 1996 and Rory McIlroy in 2011, U.S. Masters, and Jean van de Velde in 1999, British Open; elite rower Sally Robbins in 2004, Athens Summer Olympics; and professional tennis player Sam Stosur in 2009, Medibank International) accounts of choking have led researchers to develop explanatory choking models. Advocates of distraction-based models (e.g., Hardy, Mullen, & Martin, 2001; Mullen, Hardy, & Tattersall, 2005; Nideffer, 1992) postulate that choking occurs because attention shifts from task-relevant to irrelevant cues. As arousal increases, athletes become immersed in task-irrelevant thoughts, resulting in the failure to attend to relevant cues. Researchers (e.g., Hardy et al., 2001; Mullen et al., 2005) have argued that choking and its hallmark diminished performance levels occur, via the distraction model, when attention to explicit rules and worries exceed the attentional capacity needed to maintain effective performance.

Alternatively, proponents of the self-focus approach (e.g., Beilock & Carr, 2001; Jackson, Ashford, & Norsworthy, 2006; Masters, 1992) have adopted Baumeister's (1984) general account that choking occurs when a motivated athlete allocates attention to task execution because of an increase in anxiety about performing correctly. Masters more specifically theorized that pressure stimulates attention toward conscious processing of explicit rules and also tied such processes to the manner by which skills are learned. Beilock and Carr (2001) justified that monitoring the step-by-step procedures may disrupt processes of high-level skills. Recently, Jackson et al. (2006) expanded these suppositions, explaining that disruptive effects on motor skills occurs when the athlete attempts to consciously monitor *and* control movements, rather than monitor movements alone. Self-focus notions of choking have enjoyed widespread empirical substantiation, particularly in recent years (Beilock & Carr, 2001; Gucciardi & Dimmock, 2008; Jackson et al., 2006; Mesagno, Marchant, & Morris, 2009).

Competitive Anxiety / Self-Presentation Relationship

Self-presentation has received sporadic attention in prior research dealing with anxiety and performance, but why athletes use such self-monitoring techniques, particularly as subsumed in the self-focus or distraction models, has yet to be investigated. *Self-presentation* refers to behaviors aimed at conveying an image of self to others (Schlenker, 1980). Self-presentation is manifest as goal-directed actions designed to generate positive images of oneself, and to influence how others perceive and treat the self. In the original self-presentation model of social anxiety, Schlenker and Leary (1982) suggested that others' impressions are constructed and defined by the individual's goals and self-beliefs in a particular situation. Presenting the self to others in a socially desirable and positive manner will help minimize social anxiety.

Social anxiety increases, however, when people are motivated to make a desired impression on others but doubt they will be successful (Schlenker & Leary, 1982). Thus, a social situation where self-presentation concerns are abundant provides a setting in which perceptions of threat increase anxiety. As stated by Leary (1992), competitive sporting venues provide clear examples of such contexts.

Wilson and Eklund (1998) argued that it is difficult to imagine that social evaluative processes could (or would) result in perceptions of threat and anxiety without concomitant self-presentation concerns. In fact, sport anxiety researchers (e.g., Bray, Martin, & Widmeyer, 2000; Hudson & Williams, 2001; James & Collins, 1997; Lorimer, 2006; Williams, Hudson, & Lawson, 1999; Wilson & Eklund, 1998) have routinely focused on the positive relationship between anxiety and aspects of self-presentation concerns. For example, Hudson and Williams found that self-presentation concerns are more strongly related to cognitive than somatic trait anxiety, indicating that worry-related thoughts are relevant to self-presentation. Similarly, researchers (e.g., Williams et al., 1999; Wilson & Eklund, 1998) have reported that athletes experience a variety of self-presentation concerns associated with competition, including concerns about the inability to handle pressure or being incompetent. James and Collins also provided qualitative support that social evaluation and self-presentation concerns were one of eight general dimensions related to sources of competitive anxiety. Beyond trait anxiety, only one study to date has investigated the link between state anxiety and self-presentation concerns. Bray et al. found that cognitive state anxiety was correlated with performance-specific evaluative concerns, whereas somatic state anxiety was related to general, nonperformance evaluative concerns. The differences in cognitive and somatic anxiety results may be represented in the type of anxiety assessed. That is, interpretation of cognitive and somatic state anxiety may be different to that of cognitive and somatic trait anxiety, especially for somatic anxiety, because the emotions experienced in the present situation may affect interpretation of somatic state anxiety measurements. Nevertheless, these studies indicate that self-presentation concerns are a well-established link to competitive anxiety.

A Self-Presentation Choking Model

Leary (1992) conceptualized competitive anxiety as a sport-specific class of social anxiety that is associated with self-presentation in competition. Leary's seminal notions are reflected in Mesagno's (2009) self-presentation model of choking, which he based on qualitative evidence of individuals who were likely to experience choking. Analysis of participants' interviews indicated a link between perceived self-presentation and choking, explained through public self-consciousness (i.e., the tendency to focus on outwardly observable aspects of the self) and fear of negative evaluation.

Logically, individuals who experience public self-awareness (the state version of public self-consciousness) are likely to become aware of being observed, will be concerned about the audience's judgments, and may feel they are the object of others' attention. Such reactions may increase anxiety (Mor & Winquist, 2002). Athletes who have a predisposition toward fear of negative evaluation, therefore, may be likely to experience increased anxiety due to self-presentation concerns. During high-pressure situations, public self-awareness is elevated because the

performer perceives that the audience's attention is focused on the "public self" (Baumeister, 1982; Mesagno, 2009), which Baumeister defined as the image of oneself that exists in the minds of others. Leary (2001) expanded his original self-presentation theory by suggesting that social anxiety increases if there is potential for relational devaluation to occur. That is, people experience more social anxiety when they believe that the impressions made will not lead others to value their relationships with them, particularly if those impressions lead others to devalue, avoid, or reject them.

For the choking-susceptible athlete, if the public self is indeed discredited, a negative self-presentation and relational devaluation may occur. In other words, being portrayed as an unsuccessful athlete under pressure, or more drastically, a "choker," can clearly lead to self- and relational devaluation. Athletes who experience such negative emotions, unabated by appropriate coping skills, may be more likely to experience choking (Mesagno, 2009). Thus, the link between public self-awareness, self-presentation, and choking is identified when participants attempt to convey a positive self-presentation to others through performance outcome, possibly leading the athlete toward the "self-monitoring" techniques identified in the self-focus (e.g., Baumeister, 1984; Beilock & Carr, 2001; Masters, 1992) and distraction (Nideffer, 1992) models of choking.

The Present Study

The purpose of the current study was to quantitatively examine self-presentational postulates emanating from Mesagno's (2009) self-presentation model of choking. More specifically, we sought to determine whether self-presentation concerns would increase anxiety and decrease performance under pressure. To investigate this model and self-presentation claims, participants performed field hockey penalty strokes in low- and high-pressure situations, with the high-pressure phase being manipulated through assignment to either self-presentation or motivational high-pressure conditions. We hypothesized that the pressure manipulations that create self-presentation concerns would increase both cognitive and somatic anxiety during the high-pressure phase more than motivational pressure manipulations. We also predicted that heightened self-presentation concerns during the high-pressure phase would lead to decreases in performance, as mediated by state anxiety.

Method

Participants

Forty-five experienced (at least five years playing at a state or national competitive level; $M_{\text{experience}} = 9.76$, $SD = 3.07$) field hockey players ($M_{\text{age}} = 23.56$, $SD = 6.85$) participated in the study, with an equal ratio of males to females in each group. Participants were randomly assigned into one of five groups (i.e., performance-contingent monetary incentive, video camera placebo, video camera self-presentation, audience, or combined pressure), as described in the Procedure section below.

Equipment and Experimental Task

Field Hockey Apparatus. Participants used regulation field hockey sticks and balls. A regulation field hockey goal was used, with dimensions of 2.14 m high and 3.66 m wide.

Experimental Task. The experimental task involved striking the ball with the field hockey stick from a stationary standing position (called a penalty stroke) and from a designated penalty area. A regulation penalty stroke is taken 6.4 m from the goal. The participant performed the penalty stroke and attempted to hit each target as close to the goal post (and within the goal scoring area) as possible.

Target Dimensions and Location. Two expert field hockey coaches were consulted to identify the most appropriate size and location of the targets. The expert coaches included one national-level and one state-level (also a state coordinator for coaches development) coach with an average of 20.5 (SD = 3.53) years coaching experience. Targets were placed in three corners of the goal that provided the most probability of scoring if the goalkeeper was defending (i.e., top-right, bottom-right, and bottom-left corners of the goal from the penalty takers perspective). Each rectangular target measured 101.6 cm width by 45.72 cm height. The targets were divided into five equal rectangles of 20.32 cm wide to determine scoring accuracy. One target was placed flush in the top-right corner with no space between the crossbar and right post. When taking penalty strokes, it is important to shoot the ball low but off the ground for increased ball velocity and potential goal scoring, thus the bottom targets were located 5.08 cm off the ground and against the respective corner posts (see Figure 1).

Figure 1 — Goal, targets, and penalty shooting area set-up.

Measures

Revised Competitive State Anxiety Inventory-2. State anxiety was measured using the Revised Competitive State Anxiety Inventory-2 (CSAI-2R; Cox, Martens, & Russell, 2003; Martens, Burton, Vealey, Bump, & Smith, 1990), which assessed how anxious participants feel "at the present moment." Cox et al. modified the original CSAI-2 (Martens, Burton, et al., 1990) to include a total of 17 self-report statements measuring intensity components of somatic anxiety (seven items), cognitive anxiety (five items), and self-confidence (five items). Consistent with our purposes, only the cognitive and somatic anxiety subscales were used in the current study. Intensity level responses were scored on a Likert scale, ranging from 1 (*not at all*) to 4 (*very much so*). Total scores range from 10 to 40, with higher scores indicating higher anxiety levels. Cox et al. reported Cronbach alpha reliability coefficients for both cognitive and somatic anxiety to be acceptable ($\alpha > .80$).

Performance. The performance measure was the accuracy of the ball hitting the outermost part of the goal (i.e., closest to the goal post). The five sections of the target were worth "points," with five (i.e., highest) points awarded for hitting the target closest to the goal post and only one point scored if the ball hit the target farthest from the post. If the participant missed the target completely, a score of zero was earned. The objective was to accumulate the highest total points possible for the 30 penalty strokes.

Penalty Stroke Preparation Time. Jordet (2009; Jordet & Hartman, 2008) has suggested that preparation time may be important in anxiety interpretation. Thus, a comparison of each participant's completion time (in seconds) for each phase was assessed using a stopwatch. The time from the moment the ball was placed on the penalty circle to when forward motion of the penalty stroke commenced was operationalized as the preparation time.

Procedure

Participants were recruited from field hockey leagues and teams, with the head coaches' permission, and were asked to complete a demographic information sheet and an informed consent form. A plain language statement was given to participants, outlining the study objectives and indicating that the University Ethics committee had approved the project. Potential participants were then contacted to participate in the experiment and randomly assigned into one of the five groups. Three phases of testing followed. To maintain control over external factors such as weather and field conditions, the experimental phases were completed on the same field with similar weather conditions over three separate days.

Low-Pressure Familiarization 1 Phase. In the low-pressure familiarization 1 (hereafter referred to as *LP 1*) phase, only the researcher and the participant were present, thereby signifying independent testing. Before performance, general information about the experiment was explained. Testing began with the participant completing the CSAI-2R, nine warm-up shots (three shots at each target), and 30 penalty strokes under low pressure. The participant was then instructed to strike the ball with speed and accuracy (similar to a normal penalty stroke) toward the corner of the targets (nearest the goal post) for each penalty stroke. Penalty strokes were

taken in blocks of 10 shots at each target, with target blocks randomly ordered for each participant to minimize order effects. During data collection, the researcher stood to one side of the participant, signaled the commencement of the trial, and watched the ball strike the target, immediately writing down the accuracy score for each trial. Each testing session lasted between 20 and 30 min ($M = 23.64$, $SD = 4.52$).

To ensure the integrity of experience level, it was important to set a criterion for continued participation in the study, as routinely implemented in prior work (Mesagno & Mullane-Grant, 2010; Wang, Marchant, & Morris, 2004). Possible performance scores in each phase ranged from 0 to 150, but unknown to participants, a performance range of 55–125 points was set in the LP 1 phases for continued participation. This range ensured that participants were experienced, yet decreased the likelihood of ceiling effects. Three participants were excluded from further participation because they failed to achieve the minimum shooting criterion.

Low-Pressure Familiarization 2 Phase. The low-pressure familiarization 2 (hereafter referred to as *LP 2*) phase procedures were identical to those of the LP 1 phase. We counterbalanced the order of the LP 2 and high-pressure phases (described next).

Experimental Groups Manipulation and High-Pressure Phase. Before commencement of the high-pressure phase, specific experimental group manipulation instructions regarding the high-pressure were explained. In the *performance-contingent monetary incentive* group, the participant was informed that money would be received, depending on the number of successful shots relative to the phase before the high-pressure (i.e., LP 1 or LP 2). Other researchers (e.g., Beilock & Carr, 2001; Masters, 1992) have used negligible monetary amounts (e.g., US$5–$20) in combination with other manipulations to successfully induce pressure. Considering the pressure manipulations were being tested independently, it was essential that motivation was maintained. Consequently, the participant was advised that AU$20[1] would be earned for equaling the previous phase total score with an additional AU$5 for each successful point above the earlier phase score, to a maximum of AU$100. If the preceding phase score was not achieved, the participant would receive no money. At the beginning of the high-pressure phase, the participant was informed of the point score he or she achieved in the preceding phase.

Videotaping has been shown to heighten self-consciousness (Lewis & Linder, 1997), and could also increase self-presentation concerns, depending on instructions given. Accordingly, participants allocated to the *video camera placebo*[2] group performed with a video camera placed to the right and slightly in front of the participant so it could be seen in peripheral view during the penalty stroke. The participant was informed that the video camera would be facing the target throughout the high-pressure phase, but was present solely for the purpose of more accurately recording the points for each penalty stroke attempt.

The *video camera self-presentation* group was identical to the video camera placebo group with the exception that the participant was told the video camera would record performance, which would be discussed with, and shown to, his/her coach for further player development and potential penalty stroke selection at future important competitions.

The *audience* group consisted of five teammates. The audience was positioned to both sides and in peripheral view of the participant at a distance of 3 m. The

audience did not interact with participants and simply observed performance. We purposely used teammates because researchers have found that supportive audiences may elevate anxiety due to self-presentation concerns (Butler & Baumeister, 1998).

Finally, the *combined pressure* group used a combination of monetary incentive, video camera (self-presentation), and audience pressure manipulations, collectively.

Once the high-pressure group instructions were read, the participant completed the CSAI-2R. The high-pressure phase was identical to other phases with the exception that the participant performed 30 penalty strokes in his/her respective high-pressure group. After the high-pressure phase was complete, the participant was informed of the money earned, with all participants (in each group) receiving a minimum of $20 (even if the previous total score was not achieved), irrespective of their allocated group. The participant was then thanked and debriefed.

Results

To validate equivalent skill levels, separate one-way analysis of variance (ANOVA) were conducted on the performance scores in the LP 1 and LP 2 phases. The primary analyses included separate 5 (Group) × 3 (Phase) mixed-design ANOVAs with repeated measures on the phase factor, which were conducted on cognitive anxiety, somatic anxiety, performance, and preparation time. In all mixed-design ANOVAs, Mauchly's test of sphericity was violated. Thus, results are interpreted using Huynh-Feldt epsilon values. Partial eta squared (partial η^2) was used as an indicator of effect size for ANOVA calculations (Tabachnick & Fidell, 2007) and a critical alpha level of .05 was set for all statistical tests. Secondary analyses comprised simple effects and mediation analyses. In light of the results of the primary analyses, for the purpose of the secondary analyses, the data were collapsed from three into two phases (*low-pressure* = mean of LP1 and LP2; and *high-pressure*) and from five groups into two treatment types (motivational = *performance-contingent monetary incentive* and *video camera placebo* groups; and self-presentation = *video camera self-presentation, audience* and *combined pressure* groups). Mediation analysis was performed using differences in cognitive anxiety, somatic anxiety, and performance between the low- and high-pressure phases.

Skill Equivalence

Initially, it was important to ensure the homogeneity of groups. Demonstrating that groups were equal in field hockey ability in particular was important to justify accurate performance and anxiety interpretations. The LP 1 phase performance indicated no significant difference among the groups, $F(4, 44) = .15$, $p > .10$. The LP 2 phase performance also indicated no significant group differences, $F(4, 44) = .05$, $p > .10$. Thus, groups were deemed equal in penalty shooting ability.

Pressure Manipulation Verification

Cognitive anxiety results (Figure 2) indicated no significant phase, $F(1.215, 48.619) = 2.827$, $p = .09$, partial $\eta^2 = .07$, or group main effect, $F(4, 40) = 1.15$, $p > .10$, partial $\eta^2 = .10$. However, a significant Group × Phase interaction was evident, $F(4.862, 48.619) = 6.277$, $p < .001$, partial $\eta^2 = .386$, indicating a difference among

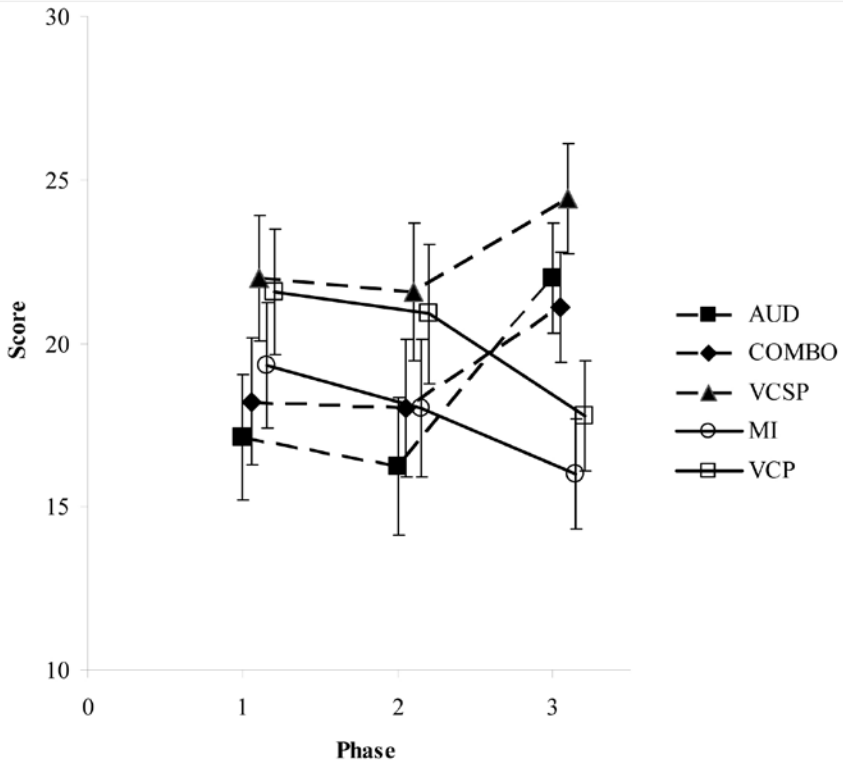

Figure 2 — Mean cognitive anxiety scores (with error bars representing standard errors) for the five groups as a function of phase. *Note.* In all figures, groups are explained with the following legend abbreviations: VCP = video camera placebo, MI = performance-contingent monetary incentive, VCSP = video camera self-presentation, COMBO = combined pressure, AUD = audience. In addition, Phase 1 = LP1, Phase 2 = LP2, and Phase 3 = High-pressure.

groups related to the change in cognitive anxiety from low- to high-pressure phases. Analyses of simple effects of treatment types within phases revealed no significant difference in cognitive anxiety between motivational and self-presentation treatment types, $F(1,43) = 0.342$, $p > .10$, partial $\eta^2 = .008$, within the low-pressure phase, and a significant difference in cognitive anxiety between motivational and self-presentation treatment types, $F(1,43) = 13.647$, $p = .001$, partial $\eta^2 = .241$, within the high-pressure phase.

For somatic anxiety (Figure 3), results revealed no significant phase, $F(1.185, 47.388) = 2.489$, $p > .10$, partial $\eta^2 = .06$, or group main effect, $F(4, 40) = 1.66$, $p > .10$, partial $\eta^2 = .14$. However, a significant Group × Phase interaction was evident, $F(4.739, 47.388) = 6.113$, $p < .001$, partial $\eta^2 = .379$, indicating a difference among groups regarding the change in somatic anxiety between low- and high-pressure phases. Analysis of simple effects of treatment types within phases revealed a significant difference in somatic anxiety between motivational and self-presentation treatment types, $F(1,43) = 7.322$, $p = .010$, partial $\eta^2 = .146$, within

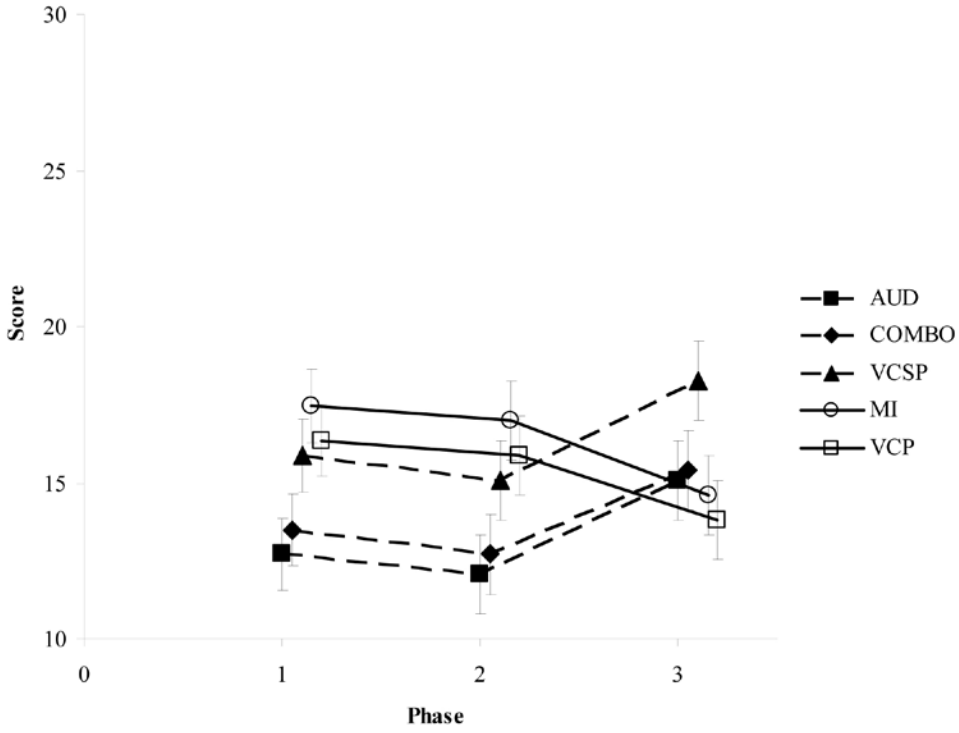

Figure 3 — Mean somatic anxiety scores (with error bars representing standard errors) for the five groups as a function of phase.

the low-pressure phase, and no significant difference in somatic anxiety between motivational and self-presentation treatment types, $F(1,43) = 3.053$, $p = .088$, partial $\eta^2 = .066$, within the high-pressure phase.

Group Performance Differences

Performance results indicated no significant group main effect, $F(4, 40) = 1.53$, $p > .10$, partial $\eta^2 = .13$, but there was a significant phase main effect, $F(1.463, 58.508) = 4.985$, $p = .018$, partial $\eta^2 = .11$. Pairwise comparisons indicated that performance in the LP 2 phase ($M = 75.22$, $SD = 17.06$) was significantly different to performance scores in the LP 1 ($M = 71.98$, $SD = 15.14$) and high-pressure phases ($M = 67.71$, $SD = 19.05$), with a nonsignificant difference between the LP 1 and high-pressure phases. The main effect for phase was qualified by a significant Group × Phase interaction, $F(5.851, 58.508) = 4.198$, $p = .002$, partial $\eta^2 = .30$. The self-presentation groups decreased performance while the other groups increased performance during the high-pressure phase, compared with the LP 2 phase (Figure 4). Analyses of simple effects of phase within treatment types revealed a nonsignificant increase in performance between low- and high-pressure phases in the motivational treatment type, $F(1,43) = 2.987$, $p = .091$, partial $\eta^2 = .065$, and a significant decrease

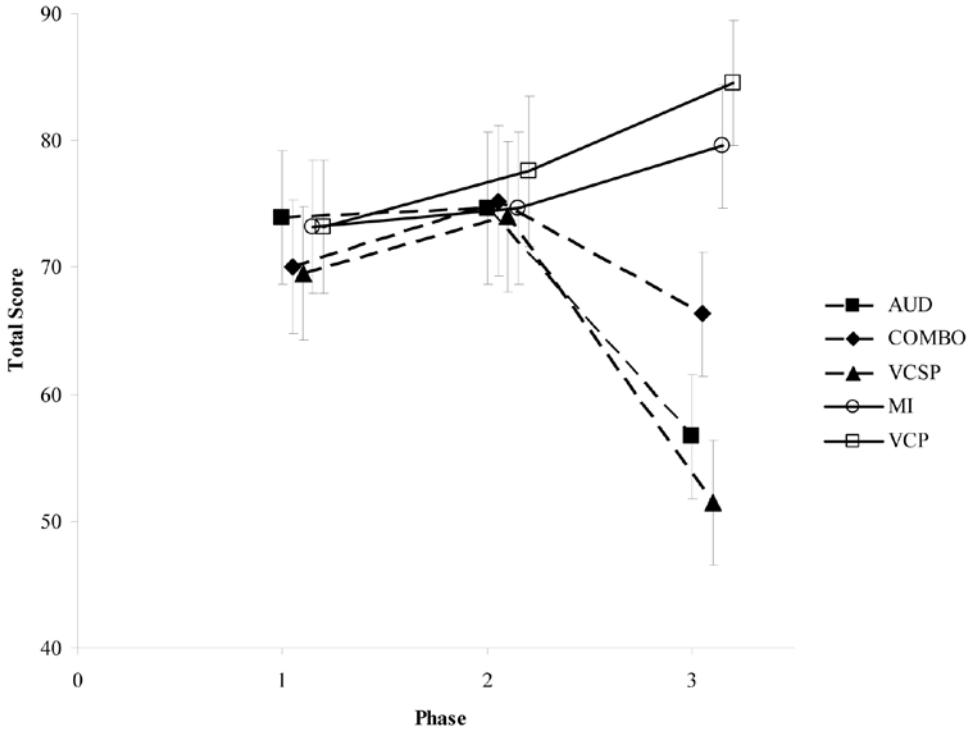

Figure 4 — Mean performance total scores (with error bars representing standard errors) for the five groups as a function of phase.

in performance between low- and high-pressure phases in the self-presentation treatment type, $F(1,43) = 17.831$, $p < .0001$, partial $\eta^2 = .293$. Simple effects tests of treatment types within phases revealed no significant difference in performance between motivational and self-presentation treatment types, $F(1,43) = 0.138$, $p > .10$, partial $\eta^2 = .003$, within the low-pressure phase, and a significant difference in performance between motivational and self-presentation treatment types, $F(1,43) = 27.084$, $p < .001$, partial $\eta^2 = .386$, within the high-pressure phase.

Preparation Time

No significant main effects or interactions emerged ($ps > .10$) for preparation time duration.

Mediation Analysis

To further investigate the significant difference in performance between motivation and self-presentation treatment types within the high-pressure phase, a mediation analysis was conducted. To test the mediating effects of cognitive and somatic anxiety between treatment types and performance, the following sequence of regression

models was evaluated (as outlined by Baron & Kenny, 1986): (i) performance was predicted from treatment type (coded motivational = 1, self-presentation = 2); (ii) cognitive and somatic anxiety were (separately) predicted from treatment type; (iii) performance was predicted (in a three-predictor model) from cognitive anxiety, somatic anxiety, and treatment type. To establish mediation, treatment type must affect performance and either cognitive anxiety or somatic anxiety (or both), which in turn must affect performance, and the signs of all the relationships must be in the expected direction. Furthermore, the effect of treatment type on performance must be significantly reduced in the three-predictor model including cognitive and somatic anxiety, compared with the one-predictor model with treatment type alone.

The results of these regression analyses are summarized in Figure 5. Because treatment type is categorical, the regression coefficients for treatment type represent the mean difference in the dependent variable between motivational and self-presentation treatment types (coded 1 and 2, respectively). Treatment type was found to be a significant predictor of performance ($b = –23.90$, $t = –5.20$, $p < .0001$) and cognitive anxiety ($b = 5.63$, $t = 3.69$, $p = .0006$), but not somatic anxiety ($b = 2.04$, $t = 1.75$, $p = .088$). Thus, the first criterion of Baron and Kenny (1986) was met, and the second criterion was met for cognitive anxiety, but not for somatic anxiety. In the three-predictor model, cognitive anxiety was found to be a significant predictor of performance ($b = –1.06$, $t = –2.07$, $p = .044$), but somatic anxiety was not ($b = –0.14$, $t = –0.20$, $p = .840$); the magnitude of the effect of treatment type on performance was found to be less than the first regression model ($b = –17.68$, $t = –3.52$, $p = .0011$). Using bias-corrected and accelerated bootstrapping (Preacher & Hayes, 2008), the reduction in the association between treatment type and performance was found to be significantly attributable to cognitive anxiety, but not to somatic anxiety (95% confidence intervals for indirect effects: cognitive anxiety [–16.96, –1.50], somatic anxiety [–4.70, 2.76], 1000 replications). Furthermore, the signs of all the relationships involving cognitive anxiety were in the expected direction. Results consistent with these were also obtained in single-mediator analyses for cognitive and somatic anxiety, respectively. Based on these results, it is concluded that cognitive anxiety is a partial mediator between treatment type and performance, but somatic anxiety is not a mediator.

The method of Fairchild, MacKinnon, Taborga, and Taylor (2009) was used to calculate an "R^2 type" effect size measure for cognitive anxiety (mediation $R^2 = .23$). Thus, 23% of the variation in performance in the high-pressure phase was attributable to treatment type (motivational vs. self-presentation) mediated by cognitive anxiety.

Discussion

We sought to determine whether self-presentation could account for choking in the context of recent conceptualizations of the construct (Mesagno, 2009). Experienced field hockey players performed penalty strokes in low- and high-pressure phases, with high pressure being elicited through either self-presentation or incentive motivational manipulations. Self-presentation was expected to increase anxiety, thereby also leading to increased incidences of choking in the high-pressure, compared with the low-pressure familiarization phases. Three primary findings emerged, with self-presentation manipulations leading to (1) greater cognitive anxiety, (2)

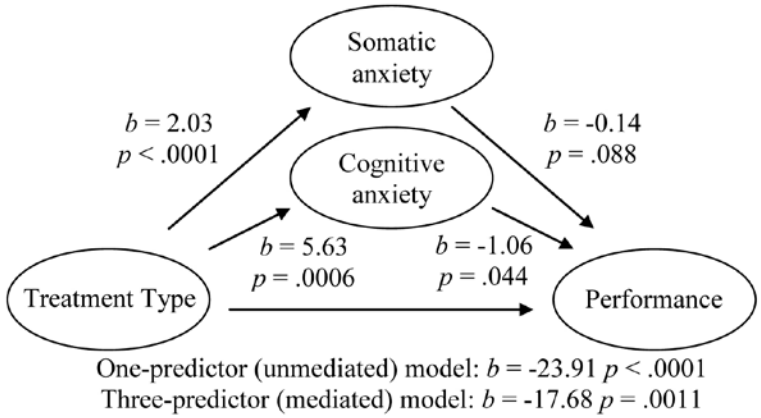

Figure 5 — Mediational models. Somatic and cognitive anxiety as mediators between treatment type (motivational or self-presentation) and performance during the high-pressure phase.

greater somatic anxiety, and (3) decreased performance during the high-pressure phase. Mediation analysis indicated that cognitive anxiety mediated the relationship between self-presentation and performance, thereby providing strong quantitative evidence for the role of self-presentation in the choking process. Each of the primary findings is discussed and theoretical implications are offered in the context of the self-presentation model of choking.

Pressure Manipulations

In the current study, we isolated the pressure manipulations commonly used in choking research to ascertain whether self-presentation components of the pressure would lead to choking. We found that the self-presentation components elevated anxiety more than motivational components of the pressure manipulations. To date, investigations of choking have not included separate pressure manipulation components to determine how these sources of pressure exert their influence. The current results, in addition to related work (e.g., Behan & Wilson, 2008; Butler & Baumeister, 1998; Hardy, Mullen, & Jones, 1996; Masters, 1992; Mesagno & Mullane-Grant, 2010; Mullen & Hardy, 2000; Mullen et al., 2005; Murray & Janelle, 2007; Wang, Marchant, & Morris, 2004; Wang, Marchant, Morris, & Gibbs, 2004; Wilson, Smith, Chattington, Ford, & Marple-Horvat, 2006; Wilson, Vine, & Wood, 2009; Wilson, Wood, & Vine, 2009), provide strong evidence that self-presentation concerns play a role in increasing anxiety primarily because of the self-presentation components of the pressure manipulations they motivate.

Only limited empirical work (e.g., Gucciardi & Dimmock, 2008; Lewis & Linder, 1997; Otten, 2009) has successfully induced significant increases in anxiety from low- to high-pressure using a performance-contingent monetary (or motivational) incentive, without a direct self-presentation component. For example, Gucciardi and Dimmock offered participants monetary prizes in the high-anxiety phase for a "putting competition." Although the competition could be considered

a motivational pressure manipulation for a monetary reward, self-presentation concerns and anxiety could be subsequently elevated because the competition may create worries about making a good impression on the researcher or "losing face" when the instructions relate to social comparison or a threat to athletic identity. To this end, past research combined with our isolated pressure manipulations may provide further support that self-presentation concerns is often a prerequisite to increased anxiety.

From the current results, laboratory-based self-presentation pressure manipulations clearly increase anxiety under pressure. It is unclear, however, whether these elevated anxiety levels are comparable to those experienced in real-world competitions. Comparing the current anxiety results with athletes' anxiety experienced leading into actual competitions, as measured using the CSAI-2R (e.g., Nicholls, Polman, & Levy, 2010), the self-presentation groups' in the current study were comparable in cognitive and somatic anxiety to athletes in real-world competitions. It appears that experimental-based pressure manipulations that promote self-presentation concerns elevate anxiety to comparable levels as actual competitions. Thus, researchers should consider using self-presentation pressure manipulations while also staying within ethical standards. Even as minimal as informing participants of a "team effort" (e.g., Beilock & Carr, 2001), whereby winning a monetary incentive is contingent on both team members performing well, may increase self-presentation concerns.

In the current study, the self-presentation groups displayed increases in both cognitive and somatic anxiety under pressure, which contradicts earlier work by Bray et al. (2000) who found that cognitive and somatic state anxiety were differentially affected. A number of limitations, including limited age range (youth) of athletes that competed in only one sport, a minimal sample size, and nonpsychometrically valid measure of performance-specific evaluation concerns, as well as different experimental designs used, could be possible reasons for the equivocal results. For example, the current study used a laboratory-based pressure manipulation with a state anxiety measure administered before performance, whereas Bray et al. employed questionnaire-based measures at two time points to assess state anxiety and self-presentation concerns. Inherently, our laboratory-based experiment may have activated both cognitive and somatic anxiety perceptions simultaneously. As suggested by Bray et al., future research should investigate the mechanisms associated with cognitive and somatic anxiety and self-presentation concerns.

Self-Presentation and Performance

To date, sport anxiety researchers have drawn correlational links between self-presentation and trait or state anxiety, without direct comparison with state anxiety and performance outcomes. For example, Wilson and Eklund (1998) found that cognitive trait anxiety was significantly correlated with the perception of self-presentation threat during competition. Lorimer (2006) also found a positive relationship between self-presentation concerns and worry (as measured in the Sport Anxiety Scale). Similarly, Bray et al. (2000) extended the trait anxiety / self-presentation link to state anxiety / self-presentation correlations, finding that cognitive and somatic state anxiety differentially correlated with self-presentation concerns. Within these correlational studies, however, no direct measure of perfor-

mance outcome was assessed, thereby limiting the implications for performance. Herein, a novel empirical link was identified among self-presentation, increases in state anxiety under high pressure, and negative performance outcomes, thereby solidifying theoretically based postulates that implicate each of these constructs.

Although poorer performance was noticed for the self-presentation groups during high-pressure, researchers (e.g., Hill, Hanton, Fleming, & Matthews, 2009) that investigate choking contend that all substandard performance is not necessarily representative of a choking experience. Clear evidence was provided that choking occurred in our self-presentation groups. Importantly, the substandard performance experienced in the high-pressure *was below all groups' performance scores in both low-pressure familiarization phases, and performance between the low- and high-pressure phases also differed*. Furthermore, in accordance with the choking definition we adopted from Mesagno et al. (2008), all self-presentation groups demonstrated an increase in anxiety, and a decrease in performance (to a substandard level).

Theoretical Implications

In his seminal contribution, Leary (1992) argued that sport fosters the creation of a variety of negative images when athletes worry about evaluation by others. Such images include being unskilled, incompetent, unprepared, unfit, or unable to handle pressure. Since Leary's conceptual paper, empirical evidence (e.g., Williams et al., 1999; Wilson & Eklund, 1998) has found that concern about the inability to handle pressure or being incompetent are linked to self-presentation and competitive anxiety. A generally agreed upon characteristic of the elite athlete is the ability to perform successfully under pressure, which is reflected in Mesagno's (2009) self-presentation model as having an athletic identity. Thus, if an athlete, especially one with high athletic identity, does not perform well under pressure, then negative emotions such as anxiety or embarrassment may result. Expanding Leary's (2001) relational devaluation construct into sport, we would argue that if an individual's (sport or athletic) identity is under threat in a pressure situation, then an increase in anxiety may occur because of the possibility for relational (and sport-specific) devaluation. Empirical evidence provided by Grove, Fish, and Eklund (2004) has indicated that changes in athletic identity occur after negative athletic experiences (i.e., being "cut" from a potential team). This relational devaluation was especially relevant for participants in the self-presentation groups because we used unique high-pressure instructions to increase anxiety. That is, not performing well under pressure in front of teammates (audience or combined groups) or when knowing that the video would be evaluated by a coach (video camera self-presentation or combined groups), may lead to potential devaluing from important others. Although this aspect of the self-presentation model of choking was not investigated in our study, future research could identify the links between athletic identity and choking.

The self-presentation model of choking that we have briefly outlined in the introduction extends choking theories into explanations for the initial anxiety increase, which cause the concomitant substandard performance in choking experiences. We believe (albeit speculatively) that the self-presentation, self-focus and distraction models can be amalgamated into one theory of choking. Theoretically, it is reasonable that initial anxiety originates from self-presentation concerns, which

leads the athlete to use approach coping strategies to cope (Wang, Marchant, Morris, & Gibbs, 2004) because the athlete attempts to understand why anxiety increases, and ruminates about the pressure situation. As a result of the predominant use of approach coping strategies, attention shifts toward self-monitoring techniques (voluntarily or involuntarily) subsumed within either the self-focus or distraction models, distracting attention away from task-relevant cues, leading to detrimental performance effects. While preliminary, we believe that existing evidence warrants consideration of a higher level and integrated theory of choking that would yield testable hypotheses.

Limitations and Future Directions

A primary concern in the current investigation was to balance ecological validity with rigorous experimental design. One methodical limitation was that our targets may not be a direct representation of shot accuracy because of their location. That is, positioning the targets in the corners only provides an accuracy measure to the inside, and not the outside, of the goal. We placed our targets in the corners for two reasons. First, the corner targets provided the most realistic targets that also reflect the demands of the sport. In field hockey penalty strokes, striking the ball as quickly as possible to the corner of the goal is essential to scoring. Missing to the outside of the goal was deemed comparatively less important because the amount of error is irrelevant considering the penalty shooting objectives. Second, the target location increased the difficulty and pressure experienced by the penalty taker, thereby providing an inherent pressure manipulation. Another limitation was that we used only the anxiety intensity component of the CSAI-2R to determine anxiety differences, and omitted the directional component (i.e., respondents' interpretation of the anxiety direction effect on performance). Thus, future research should include the anxiety direction component (e.g., Gucciardi et al., 2010). Other future choking studies should include aspects of pressure manipulations that would increase self-presentation concerns. For example, future studies could investigate whether increases in anxiety occur for different components of the pressure manipulations, such as increasing the audience size or using different important audiences (e.g., talent scouts, parents, or coaches).

In conclusion, the current data support the postulate that self-presentation may help explain why (rather than what happens when) choking under pressure occurs. The study addressed Wilson and Eklund's (1998) call to implement experimental investigations that allow for causal inferences to be made about self-presentation and anxiety. Although not a full-scale investigation of the self-presentation model of choking, our study serves as an initial investigation into whether self-presentation concerns may be a fruitful explanation of choking. Future efforts should examine whether the distraction and self-focus models of choking are subsumed under the self-presentation model, or if the self-presentation model should stand alone.

Notes

1. At the time of the study, the Australian dollar was at parity, and comparable, with the U.S. dollar.

2. We have grouped the performance-contingent monetary incentive and video camera placebo into a "motivational" group based on the monetary incentive group. We understand that the motivational group "title" may not be particularly relevant to the placebo group, but for clarity, this label was used.

Acknowledgments

We thank the University of Ballarat for their financial support and contribution to this project through an Early Career Researchers Grant to the first author. We also thank Alison Williams for participant recruitment assistance, Angela McGlashan, Catriona McNab, Tenae Jones for help with data entry and collection, and Rod Hall and Mel Razmjoo for assistance with the construction of the field hockey targets. We also appreciate the detailed recommendations that three anonymous reviewers provided, which improved the quality of the final manuscript.

References

Baron, R.M., & Kenny, D.A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51,* 1173–1182.

Baumeister, R.F. (1982). A self-presentational view of social phenomena. *Psychological Bulletin, 91,* 3–26.

Baumeister, R.F. (1984). Choking under pressure: Self-consciousness and paradoxical effects of incentives on skillful performance. *Journal of Personality and Social Psychology, 46,* 610–620.

Behan, M., & Wilson, M. (2008). State anxiety and visual attention: The role of the quiet eye period in aiming to a far target. *Journal of Sports Sciences, 16,* 207–215.

Beilock, S.L., & Carr, T.H. (2001). On the fragility of skilled performance: What governs choking under pressure? *Journal of Experimental Psychology. General, 130,* 701–725.

Beilock, S.L., & Gray, R. (2007). Why do athletes "choke" under pressure? In G. Tenenbaum & R.C. Eklund (Eds.), *Handbook of sport psychology* (pp. 425–444). Hoboken, NJ: Wiley.

Bray, S.R., Martin, K.A., & Widmeyer, W.N. (2000). The relationship between evaluative concerns and sport competition state anxiety among youth skiers. *Journal of Sports Sciences, 18,* 353–361.

Butler, J.L., & Baumeister, R.F. (1998). The trouble with friendly faces: Skilled performance with a supportive audience. *Journal of Personality and Social Psychology, 75,* 1213–1230.

Cox, R.H., Martens, M.P., & Russell, W.D. (2003). Measuring anxiety in athletics: The revised Competitive State Anxiety Inventory-2. *Journal of Sport & Exercise Psychology, 25,* 519–533.

Fairchild, A.J., MacKinnon, D.P., Taborga, M.P., & Taylor, A.B. (2009). R^2 effect-size measures for mediation analysis. *Behavior Research Methods, 41,* 486–498.

Grove, J.R., Fish, M., & Eklund, R.C. (2004). Changes in athletic identity following team selection: Self-protection versus self-enhancement. *Journal of Applied Sport Psychology, 16,* 75–81.

Gucciardi, D.F., & Dimmock, J.A. (2008). Choking under pressure in sensorimotor skills: Conscious processing or depleted attentional resources? *Psychology of Sport and Exercise, 9,* 45–59.

Gucciardi, D.F., Longbottom, J., Jackson, B., & Dimmock, J.A. (2010). Experienced golfers' perspectives on choking under pressure. *Journal of Sport & Exercise Psychology, 32,* 61–83.

Hardy, L., Mullen, R., & Jones, G. (1996). Knowledge and conscious control of motor actions under stress. *The British Journal of Psychology, 87,* 621–636.

Hardy, L., Mullen, R., & Martin, N. (2001). Effect of task-relevant cues and state anxiety on motor performance. *Perceptual and Motor Skills, 92,* 942–946.

Hill, D.M., Hanton, S., Fleming, S., & Matthews, N. (2009). A re-examination of choking in sport. *European Journal of Sport Science, 9*(4), 203–212.

Hudson, J., & Williams, M. (2001). Associations between self-presentation and competitive A-trait: A preliminary investigation. *Social Behavior and Personality, 29,* 1–10.

Jackson, R.C., Ashford, K.J., & Norsworthy, G. (2006). Attentional focus, dispositional reinvestment, and skilled motor performance under pressure. *Journal of Sport & Exercise Psychology, 28,* 49–68.

James, B., & Collins, D. (1997). Self-presentational sources of competitive stress during performance. *Journal of Sport & Exercise Psychology, 19,* 17–35.

Janelle, C.M., & Gamble, K.M. Measuring emotional reactivity. (in press). In G. Tenenbaum, R. Eklund, & A. Kamata (Eds.), *Handbook of measurement in sport and exercise psychology*. Champaign, IL: Human Kinetics.

Jordet, G. (2009). When superstars flop: Public status and choking under pressure in international soccer penalty shootouts. *Journal of Applied Sport Psychology, 21,* 125–130.

Jordet, G., & Hartman, E. (2008). Avoidance motivation and choking under pressure in soccer penalty shootouts. *Journal of Sport & Exercise Psychology, 30,* 450–457.

Leary, M.R. (1992). Self-presentational processes in exercise and sport. *Journal of Sport & Exercise Psychology, 14,* 339–351.

Leary, M.R. (2001). Social anxiety as an early warning system: A refinement and extension of the self-presentation theory of social anxiety. In S.G. Hoffman & P.M. DiBartolo (Eds.), *From social anxiety to social phobia: Multiple perspectives* (pp. 321–334). Needham Heights, MA: Allyn & Bacon.

Lewis, B.P., & Linder, D.E. (1997). Thinking about choking? Attentional processes and paradoxical performance. *Personality and Social Psychology Bulletin, 23,* 937–944.

Lorimer, R. (2006). The relationship between self-presentational concerns and competitive anxiety: The influence of gender. *International Journal of Sport and Exercise Psychology, 37,* 317–329.

Martens, R. (1977). *Sport competitive anxiety test*. Champaign, IL: Human Kinetics.

Martens, R., Burton, D., Vealey, R.S., Bump, L.A., & Smith, D.E. (1990). Development and validation of the CSAI-2. In R. Martens, R.S. Vealey, & D. Burton (Eds.), *Competitive anxiety in sport* (pp. 117–190). Champaign, IL: Human Kinetics.

Martens, R., Vealey, R.S., & Burton, D. (1990). *Competitive anxiety in sport*. Champaign, IL: Human Kinetics.

Masters, R.S.W. (1992). Knowledge, nerves and know-how. *The British Journal of Psychology, 83,* 343–358.

Mesagno, C. (2009, June). *Choking under pressure: Toward a self-presentation explanation of why athletes use self-monitoring techniques.* Paper presented at the 12th World Congress of Sport Psychology, Marrakesh, Morocco.

Mesagno, C., Marchant, D., & Morris, T. (2008). A pre-performance routine to alleviate choking in "choking-susceptible" athletes. *The Sport Psychologist, 22,* 439–457.

Mesagno, C., Marchant, D., & Morris, T. (2009). Alleviating choking: The sounds of distraction. *Journal of Applied Sport Psychology, 21,* 131–147.

Mesagno, C., & Mullane-Grant, T. (2010). A comparison of different pre-performance routines as possible choking interventions. *Journal of Applied Sport Psychology, 22,* 343–360.

Mor, N., & Winquist, J. (2002). Self-focused attention and negative affect: A meta-analysis. *Psychological Bulletin, 128,* 638–662.

Mullen, R., & Hardy, L. (2000). State anxiety and motor performance: Testing the conscious processing hypothesis. *Journal of Sports Sciences, 18,* 785–799.

Mullen, R., Hardy, L., & Tattersall, A. (2005). The effects of anxiety on motor performance: A test of the conscious processing hypothesis. *Journal of Sport & Exercise Psychology, 27,* 212–225.

Murray, N.P., & Janelle, C.M. (2007). Event-related potential evidence for the processing efficiency theory. *Journal of Sports Sciences, 25,* 161–171.

Nicholls, A.R., Polman, R., & Levy, A.R. (2010). Coping self-efficacy, pre-competitive anxiety, and subjective performance among athletes. *European Journal of Sport Science, 10,* 97–102.

Nideffer, R.M. (1992). *Psyched to win*. Champaign, IL: Leisure Press.

Otten, M. (2009). Choking vs. clutch: A study of sport performance under pressure. *Journal of Sport & Exercise Psychology, 31,* 583–601.

Preacher, K.J., & Hayes, A.F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods, 40,* 879–891.

Schlenker, B.R. (1980). *Impression management: The self-concept, social identity, and interpersonal relations*. Monterey, CA: Brooks/Cole.

Schlenker, B.R., & Leary, M.R. (1982). Social anxiety and self-presentation: A conceptualization and model. *Psychological Bulletin, 92,* 641–669.

Tabachnick, B.G., & Fidell, L.S. (2007). *Experimental designs using ANOVA*. Belmont, CA: Thomson Brooks/ Cole.

Wang, J., Marchant, D.B., & Morris, T. (2004). Coping style and susceptibility to choking. *Journal of Sport Behavior, 27,* 75–92.

Wang, J., Marchant, D.B., Morris, T., & Gibbs, P. (2004). Self-consciousness and trait anxiety as predictors of choking in sport. *Journal of Science and Medicine in Sport, 7,* 174–185.

Williams, M., Hudson, J., & Lawson, R.J. (1999). Self-presentation in sport: Initial development of a scale for measuring athletes' competitive self-presentation concerns. *Social Behavior and Personality, 27,* 487–502.

Wilson, M., Smith, N.C., Chattington, M., Ford, M., & Marple-Horvat, D.E. (2006). The role of effort in moderating the anxiety-performance relationship: Testing the prediction of processing efficiency theory in simulated rally driving. *Journal of Sports Sciences, 24,* 1223–1233.

Wilson, M., Vine, S.J., & Wood, G. (2009). The influence of anxiety on visual attentional control in basketball free throw shooting. *Journal of Sport & Exercise Psychology, 31,* 152–168.

Wilson, M., Wood, G., & Vine, S.J. (2009). Anxiety, attentional control, and performance impairment in penalty kicks. *Journal of Sport & Exercise Psychology, 31,* 761–775.

Wilson, P., & Eklund, R.C. (1998). The relationship between competitive anxiety and self-presentational concerns. *Journal of Sport & Exercise Psychology, 20,* 81–97.

Manuscript submitted: July 26, 2010

Revision accepted: March 2, 2011