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# Psychological Coping Skills as Predictors of Collegiate Golf Performance: Social Desirability as a Suppressor Variable

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The distinction made by Lazarus and Folkman (1984) and by Bandura (1997) between coping strategy selection ("ways of coping") and successful execution of coping behaviors (coping skills) is the basis for 2 types of sport-related coping measures. First, we discuss how these constructs and measures differ. Then we describe a longitudinal study involving relations between scores on the Athletic Coping Skills Inventory-28 (ACSI) and subsequent athletic performance in a study of 103 men and women collegiate golfers. Significant relations were found between the ACSI scales and performance, and gender differences were observed in coping skills as well as in relations of specific ACSI subscales to performance. We assessed the potential role of social desirability (Marlowe-Crowne Social Desirability Scale) as a suppressor variable that can enhance relations between self-reported psychological attributes and behavioral outcome measures by extracting systematic error variance from predictor variables. On average, performance variance accounted for by the ACSI subscales increased from 30% to 39% for men and from 23% to 30% for women with scores on the Marlowe-Crowne Social Desirability scale controlled. Finally, we discuss conditions under which the impression management variant of social desirability acts a suppressor variable or, conversely, attenuates relations between predictor and outcome variables.

*Keywords:* Athletic Coping Skills Inventory-28, psychological skills, sport performance, social desirability, suppressor variable



The competitive pressures endemic to the sport environment, the high level of involvement of those who populate that environment, and the availability of performance measures of unquestioned ecological validity make sport an ideal environment for studying coping strategies and skills. Not surprisingly, the past two decades have witnessed the development of coping measures and the study of coping in relation to a wide range of sport phenomena (Anshel, Sutarso, & Jubenville, 2009; Doron & Gaudreau, 2014; Gaudreau & Blondin, 2002; Hardy, Roberts, Thomas, & Murphy, 2010; Smith, Schutz, Smoll, & Ptacek, 1995). Much of this emphasis parallels developments in the study of coping in other areas of psychology (Lazarus, 2000), current work in behavioral and emotion self-regulation (Gross, 2014), and cognitive–behavioral psychological skills interventions in clinical and sport psychology (Barlow, 2002; Hardy, Jones, & Gould, 1996; Luiselli & Reed, 2011).

In a commentary on future directions for coping research, Lazarus (2000, p. 672) stated, "The most serious problem not yet faced in research is the need, mostly unfulfilled as yet, to go beyond subjective evaluations of outcomes of coping to other criteria, such as behavioral, physiological, and objective health-related outcomes." Sport is an ideal setting for such research, for measures with unquestioned ecological validity are obtainable. Performance measures are readily available, as are objective medical measures, such as injury- and illness-related time loss and bone scans. In the medical domain, stress-related coping deficits are related

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to risk of physical injury (Johnson & Ivarsson, 2011; Noh, Morris, & Andersen, 2005; Smith, Smoll, & Ptacek, 1990; Wiechman, Smith, Smoll, & Ptacek, 2000) and physical illness (Yi, Smith, & Vitaliano, 2005), as well as to eating disorders (Estanol, Shepherd, & MacDonald, 2013).

In this article, we focus on relations between coping variables and sport performance. The article has conceptual, empirical, and methodological facets. At the conceptual level, we distinguish between coping strategy selection ("ways of coping") and coping skills. At the empirical level, we provide new evidence concerning the influential role that dispositional coping skills can have on the performance of college athletes in the sport of golf, as well as on gender similarities and differences. At the methodological level, we demonstrate how social desirability (SD) response set, frequently ignored in coping research, can serve as a suppressor variable by extracting systematic error variance from a predictor variable, thereby enhancing relations with a behavioral outcome measure.

## Coping Strategies and Coping Skills

Lazarus and Folkman (1984) defined coping as "constantly changing cognitive and behavioral efforts to manage specific demands that are appraised as taxing or exceeding the resources of the person" (p. 141). We define athletic coping skills as overt and covert cognitive, affective, and behavioral self-regulatory behaviors that help athletes deal with the demands of the sport environment. In order to maximize performance, athletes must develop their technical and strategic capabilities and profit from instruction. They must also be able to regulate attentional and emotional processes so as to focus on task-relevant cues and keep arousal within an adaptive range. Performance is enhanced when athletes can think adaptively in competitive situations and formulate and persist in the pursuit of reasonable goals. They must be able to cope with adversity, develop and maintain self-efficacy, and appraise competitive situations in a manner that fosters consistency in performance, even in pressure situations (Bunker, 2006; Hardy et al., 1996; Smith & Christensen, 1995). All of these capabilities can be regarded as psychological coping skills that are carried out with varying levels of competence.

As Lazarus and Folkman (1984) have noted, coping is a complex process whose outcomes depend upon two key conditions. The first involves the selection of coping strategies that are appropriate to the demands of the situation. However, appropriate selection by itself does not guarantee a successful coping outcome. It is also necessary that the coping behaviors be executed in a competent fashion (see also Bandura, 1997). This distinction between strategy choice and skillfulness of execution has inspired the development of two classes of sport-relevant coping measures that are conceptually different but sometimes confused with one another. One class addresses coping strategy selection (sometimes referred to as coping style) and is based on such scales as the Ways of Coping Checklist (Lazarus & Folkman, 1984) and the COPE inventory (Carver, Scheier, & Weintraub, 1989). Scales such as the Modified COPE (MCOPE; Crocker & Graham, 1995) and the Coping Strategies in Sport Competition Inventory (CICS; Gaudreau & Blondin, 2002) are "extent used" measures that, in accordance with the above distinction, explicitly avoid any reference to coping efficacy or outcome. Such scales are typically applied in a retrospective fashion following stressful encounters to study situational coping processes and outcomes.

The other class of coping scales, derived from the cognitive–behavioral and psychological skills training traditions, contains items based on empirically supported psychological strategies and processes that enhance performance (for reviews, see Gardner & Moore, 2007; Luiselli & Reed, 2011; Rumbold, Fletcher, & Daniels, 2012). They include the Test of Performance Strategies 2 (Hardy et al., 2010) and the Athletic Coping Skills Inventory-28 (ACSI; Smith et al., 1995). Items on the ACSI ask athletes how consistently and effectively they apply such strategies across competitive situations (e.g., "When things are going badly, I tell myself to keep calm, and this works for me" and "When I'm playing sports, I can focus my attention and block out distractions"). Other items reference cognitive appraisals that underlie attributes such as mental toughness ("To me, pressure situations are challenges that I welcome") or goal-directed achievement behaviors ("When I fail to reach my goals, it

makes me try even harder"). The distinction between strategy selection and strategy efficacy drawn by Lazarus and Folkman (1984) is reflected in the fact that the ACSI subscales correlate minimally ($r < .22$) with the Ways of Coping subscales, but more substantially (+.44) with Rosenbaum's (1980) Self-Control Schedule, which measures cognitive-behavioral self-regulation skills, and with Coppel's (1980) General Self-Efficacy scale (+.58), which measures dispositional coping efficacy across many life domains (Smith & Christensen, 1995).

The situation-specific CICS ways-of-coping scale (Gaudreau & Blondin, 2002) has been widely applied and has proven itself valuable for within-person analyses of the coping process as it unfolds and for assessment of coping-preference relations with other self-report measures of psychological processes. However, relations with subjective performance measures have been modest even when both the performance and the coping measure have been applied retrospectively through self-report, introducing the possibility of retrospective attributional bias. Relations with objective performance have been smaller yet. In a well-executed intrasubject study that sequentially tracked coping-use reports and behavioral performance during amateur golfers' practice and competitive rounds, no significant relations were found between coping strategy reports and subsequent golf performance (Gaudreau, Nicholls, & Levy, 2010). These findings are in accord with Bandura's (1997) and Lazarus's (2000) position that coping strategy adoption alone does not guarantee a positive coping outcome without taking into account how effectively the strategy is executed.

In contrast with the modest relations found between coping strategy selection measures and athletic performance, coping skills measures have done somewhat better. The TOPS measure, which assesses nine psychological skills, has successfully discriminated between Olympic medalists and nonmedalists on emotional control, automaticity, negative thinking, and imagery scales (Taylor, Gould, & Rolo, 2008). Likewise, the ACSI has yielded significant relations with objective performance across a variety of sports (Daroglou, 2011; Karamousalidis, Bebetsos, & Laparidis, 2006; Smith & Christensen, 1995). A study of elite gymnasts competing in the Hellenic Games revealed that five of the ACSI subscales (Goal Setting and Mental Preparation; Confidence and Achievement Motivation; Coachability, Coping with Adversity, and Freedom from Worry) discriminated significantly between successful and less-successful performers (Daroglou, 2011). "Resilient" athletes who bounced back from an initial poor performance to a successful one at the Australian National Championships scored significantly higher on the Coping with Adversity and Peaking under Pressure subscales than did those who continued to perform poorly (Mummery, Schofield, & Perry, 2004).

Most studies relating coping skills to performance have examined performance over a relatively brief period, or they have assessed coping skills following performance (e.g., Taylor et al., 2008), introducing the possibility of retrospective bias in skill-effectiveness reports based on knowledge of results. To our knowledge, only one study has tracked behavioral measures of performance over an extended period of time. In a longitudinal study involving professional baseball players, hierarchical regression analyses controlling for experts' physical skills ratings revealed that physical skill differences explained 21% of the variance in batting averages over the next 6 months in nonpitchers, whereas ACSI subscales completed 6 months earlier accounted for an additional 23%. For pitchers, physical skills ratings accounted for only 3% of performance variance, whereas psychological skills accounted for an additional 34%. ACSI scores also predicted survival and career termination over the following 2 years with 67% accuracy, a figure that far exceeded predictions based on the sample's 29% survival base rate (Smith & Christensen, 1995). On the basis of these results and those of the ACSI studies cited above, we predicted that the ACSI scales and the total score would be significant predictors of golf performance.

Although gender differences have proven to be important in many areas of sport psychology, including coping strategy selection (e.g., Anshel et al., 2009), they have received relatively little attention in research on coping skills and performance. The Smith and Christensen (1995) study of male professional baseball players obviously precluded a gender analysis. On the original version of the TOPS, Thomas, Murphy, and Hardy (1999) found differences in goal

setting, imagery, and activation skills in both male and female athletes as a function of competitive level. However, women at various competitive levels also differed on self-talk, relaxation, and negative thinking subscales, whereas men did not. Taylor et al. (2008) found that female Olympians differed from men on the TOPS only in greater use of positive self-talk during competition. In the revision that resulted in the improved TOPS 2, no analyses of gender differences were reported (Hardy et al., 2010). At this point, therefore, more information is needed regarding (a) whether men and women differ in their self-appraised psychological skills and (b) whether differential relations between coping skills and performance occur for men and women. In the absence of a sound theoretical basis for making predictions, our approach to these questions is exploratory and descriptive rather than hypothesis-driven in nature.

## Social Desirability as a Potential Suppressor Variable

It is well established that scores derived from self-report can be influenced by situational variables and by motivational factors present during administration (Block, 1965; Edwards, 1957; Paulhus, 1984). According to classical psychometric theory, the score on any measure reflects not only the "true score" of the construct being measured but also method variance based on the measurement mode, plus systematic and random error variance that detracts from the score's validity (Nunnally & Bernstein, 1994). For many self-report measures, including the ACSI, one source of systematic error variance is individual differences in the tendency to respond to items in a socially desirable manner rather than in terms of their personal applicability (Block, 1965; Edwards, 1957). Controlling for social desirability (SD) response variance created by the desire to convey a favorable impression can influence statistical relations between self-report measures such as the ACSI, which correlates moderately with the Marlowe-Crowne Social Desirability Scale (M-CSDS; Crowne & Marlowe, 1964; Smith & Christensen, 1995). In contrast to self-report measures, medical and objective performance measures are typically uncorrelated with SD measures. When studies involve relations between self-report measures influenced by SD and medical or behavioral criterion variables unrelated to SD, relations between predictor and criterion variables can increase when SD variance is extracted from the predictor variable(s). In such instances, SD is said to function as a suppressor variable because it "suppresses" the SD error variance component in the predictor variable that detracts from the predictor score's validity (Nunnally & Bernstein, 1994).

SD suppressor effects have seldom been explored in sport psychology research, but they may be important to take into account. In a longitudinal study of psychological factors and high school sport injuries, controlling for high M-CSDS scores caused a previously nonsignificant moderator effect to emerge, showing ACSI coping skills to be a significant protective factor in the relation between stressful life events and injury time loss (Wiechman et al., 2000). To the present time, however, SD has not been statistically controlled in research linking coping skills with objective performance variables.

In this longitudinal study, we examined the role of ACSI-defined psychological coping skills in the performance of collegiate golfers during a competitive season and postseason tournament. Because of golf's technical and strategic demands, together with the pressures that attend the competitive environment, psychological factors are thought to be particularly important in high-level golf (e.g., Bunker, 2006). A second objective was to explore the potential role of SD response set as a potential suppressor variable that, when controlled, could strengthen relations between ACSI scores and performance. In the only previous study linking SD with a behavioral performance variable, Williams and Krane (1992), citing significant negative correlations between SD scores and anxiety measures, reasoned that low anxiety scores could result from socially desirable responding in athletes who actually have high anxiety, thereby increasing anxiety measurement error. By eliminating golfers with high M-CSDS scores and low anxiety scores (labeled "repressors") from their analysis, they doubled the amount of tournament golf performance variance accounted for by a measure of competitive trait anxiety during a golf tournament. Because SD was not measured in the Smith and Christensen (1995) study described earlier, it is

possible that the baseball performance variance attributable to coping skills, though substantial, may actually have been underestimated. The present study is, therefore, the first to apply traditional methods for assessing possible SD suppressor effects in a longitudinal study involving a behavioral performance outcome measure.

Finally, we examined gender similarities and differences in relations between coping skills and performance. Although gender differences in athletes' preferred coping strategies have been studied extensively (e.g., Anshel et al., 2009; Tamres, Janicki, & Helgeson, 2002), potential gender differences in relations between coping skills and performance have received little attention in previous research involving either the ACSI or the TOPS (Taylor et al., 2008). A replicated body of findings is a necessary precursor to eventual theory development.

## Method

### Participants and Procedure

Participants were 111 male and 78 female varsity golfers from 10 universities in a National Collegiate Athletic Association Division 1 conference. Mean age was 19.7 years ($SD$ = 1.22). Eighty-seven percent were Caucasian, 9% were Asian or Pacific Islander, and 4% were Hispanic. Following Institutional Review Board approval and with the permission of each of the 20 head coaches, the first author traveled to each university site and personally administered a consent form and a set of questionnaires, including the ACSI and the M-CSDS. In team sessions with the coach absent, the athletes were told that the study involved psychological factors in golf and that their performance would be followed over the remaining 4 months of the season. They were assured that their questionnaires, on which they identified themselves, were confidential and that they would receive a report of the study's overall results. All agreed to participate.

### Measures

**Psychological skills.** Psychological skills were assessed with the Athletic Coping Skills Inventory-28 (ACSI; Smith et al., 1995). The ACSI consists of seven four-item psychological coping skill subscales: Coachability (e.g., "I improve my skills by listening carefully to advice and instruction from coaches"); Concentration (e.g., "When I'm playing sports, I can focus my attention and block out distractions"); Confidence and Achievement Motivation (e.g., "I feel confident that I will play well"); Coping with Adversity (e.g., "When things are going badly, I tell myself to keep calm, and this works for me"); Goal Setting and Mental Preparation (e.g., "On a daily or weekly basis, I set very specific goals for myself that guide what I do"); Peaking under Pressure (e.g., "I tend to play better under pressure because I think more clearly"); and Freedom from Worry (e.g., "I put a lot of pressure on myself by worrying about how I will perform" [reverse-scored]). Each item is answered on a 4-point scale ranging from 0 (*almost never*) to 3 (*almost always*). The individual items or the subscale scores can be summed to create a Personal Coping Resources (total) score that provides a summary measure of coping resources. In our sample, internal consistency (Cronbach's alpha) of the seven subscales ranged from .69 to .87 (see Table 1), and the total score yielded an alpha coefficient of .79.

The ACSI was derived through a sequence of exploratory and confirmatory factor analyses (EFA and CFA, respectively) in an analytic procedure designed to ensure that EFAs and CFAs were not conducted on identical samples (but cf. Thomas et al., 1999). From an original set of 87 items reflecting a wide variety of psychological skills, an initial EFA using 637 high school and college athletes revealed a seven-factor structure. This structure was replicated in a different cross-validation sample of 579 high school athletes and shown to replicate in both men and women in follow-up EFAs. The various EFA subsamples were then combined for CFAs using the entire sample of 1,216 athletes (Smith et al., 1995). Factorial validity of the ACSI's seven-factor measurement model was supported by a CFA that yielded an acceptable fit (comparative fit index = .91, root-mean-square error of approximation = .044). Follow-up CFAs indicated that the factor structure was stable for men and women. Comparative fit indices of .92 have also been reported for Spanish (Graupera Sanz, Pérez, Coll, & Smith, 2011) and Greek (Goudas, Theodorakis, & Karamou-

Table 1
*Descriptive Statistics for the Predictor and Performance Variables for Men and Women*

| Measure or variable | Men | | Women | | Univariate | | |
|---|---|---|---|---|---|---|---|
| | *M* | *SD* | *M* | *SD* | *F*(1, 100) | $\eta^2$ | α |
| ACSI subscale/total score | | | | | | | |
| Coachability | 9.93 | 1.86 | 9.72 | 1.96 | 0.32 | .003 | .69 |
| Concentration | 8.25 | 2.26 | 7.86 | 1.98 | 0.84 | .008 | .70 |
| Confidence and Achievement Motivation | 8.74 | 1.83 | 8.28 | 2.48 | 1.13 | .011 | .74 |
| Freedom from Worry | 8.14 | 2.56 | 7.08 | 2.70 | 4.21* | .040 | .78 |
| Coping with Adversity | 8.05 | 2.10 | 6.98 | 2.77 | 4.88* | .046 | .75 |
| Goal Setting and Mental Preparation | 6.09 | 2.12 | 6.52 | 3.05 | 0.68 | .007 | .79 |
| Peaking under Pressure | 9.06 | 2.51 | 7.60 | 3.24 | 6.27* | .058 | .87 |
| Total score | 58.64 | 9.74 | 54.08 | 12.80 | 3.51 | .034 | .79 |
| M-CSDS | 7.06 | 2.41 | 7.74 | 2.40 | 1.80 | .018 | .66 |
| Performance variable | | | | | | | |
| Season stroke average | 75.20 | 2.31 | 78.10 | 3.35 | 26.28** | .206 | |
| Tournament average | 74.96 | 2.67 | 76.87 | 3.19 | 11.60** | .103 | |

*Note.* Men: $n = 53$; women: $n = 50$. Gender differences are based on multivariate analysis of variance. ACSI = Athletic Coping Skills Inventory-28; M-CSDS = Marlowe-Crowne Social Desirability Scale.
* $p < .05$. ** $p < .001$.

salidis, 1998) versions of the scale, indicating cross-cultural consistency in the underlying factor structure. The construct validity of the ACSI has been supported as a measure of sport-relevant psychological skills by its relations with an array of other theoretically relevant self-report and behavioral measures (e.g., Daroglou, 2011; Estanol et al., 2013; Smith & Christensen, 1995).

**Social desirability.** SD response set was assessed using a 13-item short form of the Marlowe-Crowne Social Desirability Scale (M-CSDS; Crowne & Marlowe, 1964) that correlated .93 with the original 33-item scale (Reynolds, 1982). High scores on the M-CSDS reflect an unrealistically positive self-presentation in which common faults are denied and saintly attributes are claimed. Sample true–false items include "I have never deliberately said something that hurt someone's feelings" (true); "I am always courteous, even to people who are disagreeable" (true); and "I sometimes feel resentful when I don't get my way" (false). Reynolds (1982) reported an alpha coefficient of .76 for this scale. In our sample, alpha was .66.

**Performance measure.** Number of strokes per round is the acknowledged index of golf performance, because it determines the outcome of competition. Stroke average per competitive round over the second half of the season and during the postseason conference tournament therefore served as the golf performance measures. At the conclusion of the season, performance data were obtained from the *Golfstat* Web site, which provides detailed statistics for collegiate golfers.

## Results

In order to obtain a representative and stable set of performance data, we retained for our analyses golfers who had at least five rounds of tournament competition during the second half of the regular season, when the teams were largely competing against one another, and who also participated in the postseason tournament. The resulting men's sample ($n = 53$) played a median of 15 regular-season rounds ($M = 12.59$, $SD = 3.40$), and the women ($n = 50$) a median of 11 rounds ($M = 9.68$, $SD = 2.19$). During the postseason conference tournament, the men played four rounds (72 holes), and the women three rounds (54 holes).

Table 1 shows descriptive statistics for the predictor and performance variables for men and women, together with internal consistency (Cronbach's alpha) coefficients for the self-report measures. Multivariate analysis of variance (MANOVA) was used to assess possible gender differences on the ACSI, M-CSDS, and performance measures. The MANOVA yielded a significant multivariate gender effect, $F(10,$

92) = 3.91, $p < .000$. Results of follow-up univariate analyses, also shown in Table 1, revealed significantly lower stroke averages (better performance) for men during both the regular season and the postseason tournament. Significant gender differences also occurred on three of the seven ACSI scales. Women scored significantly lower than did men on the Coping with Adversity and Peaking under Pressure subscales while scoring higher than did men on the Control of Worry subscale. Men and women did not differ on the M-CSDS or on the ACSI total Personal Coping Resources score.

## Prediction of Performance

To assess performance relations with gender, M-CSDS scores, and ACSI subscales, we performed two hierarchical regression analyses in which we entered the gender variable (dummy-coded 0 for women and 1 for men) and M-CSDS control variables at Steps 1 and 2, and then the block of ACSI scores at Step 3. The dependent variables were seasonal and tournament stroke averages, respectively. As shown in Table 2, the control and predictor variables accounted for 43% of seasonal performance variance, $F(9, 93) = 7.69$, $p < .000$, and 29% of the tournament variance, $F(9, 93) = 4.23$, $p < .000$. As expected given the gender differences shown in Table 1, gender accounted for significant variance, but SD did not.

The ACSI scales as a group accounted for significant additional variance with gender and SD controlled, but, as shown in Table 2, none of the ACSI beta coefficients were significant. Because the beta statistic assesses *unique* variance attributable to the individual predictors, this type of result can occur when the predictor variables are correlated both with the dependent variable and with one another, thereby sharing substantial common variance (Cohen, Cohen, West, & Aiken, 2003; Tabachnick & Fidell, 2013). In our sample, the average correlation among ACSI the scales was .35, and nine of the 21 coefficients exceeded .40, reflecting the fact that athletes high in one attribute are often high in others as well. A more informative index of the direct predictive relations between each of the ACSI scales and the dependent variable after gender and social desirability were controlled in previous steps is shown by the beta-in coefficients provided by the SPSS Version 19 program (see Table 2). These coefficients show what would result if each subscale (rather than

Table 2
*Hierarchical Multiple Regression Analyses Predicting Regular-Season and Postseason Tournament Performance (Stroke Average) on the Basis of ACSI Subscale Scores, Controlling for Gender and M-CSDS*

| Predictor | Regular season | | | Postseason tournament | | |
|---|---|---|---|---|---|---|
| | $\Delta R^2$ | β | β-in[a] | $\Delta R^2$ | β | β-in[a] |
| Step 1 | .21*** | | .21 | .10*** | | |
| Gender | | −.45*** | | | −.32** | |
| Step 2 | .01 | | | .02 | | |
| M-CSDS | | .11 | .11 | | .13 | |
| Step 3 | .21*** | | | .17** | | |
| ACSI | | | | | | |
| Coachability | | .12 | .06 | | .06 | .04 |
| Concentration | | −.05 | −.30*** | | −.04 | −.27** |
| Confidence and Achievement Motivation | | −.19 | −.40*** | | −.24 | −.40*** |
| Coping with Adversity | | −.02 | −.21* | | −.05 | −.18 |
| Goal Setting and Mental Preparation | | −.10 | −.32*** | | −.16 | −.34*** |
| Peaking under Pressure | | −.23* | −.38*** | | −.08 | −.27** |
| Freedom from Worry | | −.05 | −.23* | | −.01 | −.16 |
| Total $R^2$ | .43*** | | | .29*** | | |

*Note.* $N = 103$ male and female golfers. ACSI = Athletic Coping Skills Inventory-28; M-CSDS = Marlowe-Crowne Social Desirability Scale.
[a] β-in is the regression coefficient that would result if the variable were entered alone at Step 3 after controlling for gender and M-CSDS scores (i.e., the variable's direct rather than unique contribution).
* $p < .05$. ** $p < .01$. *** $p < .001$.

the entire set) were the sole entry at Step 3. The beta-in coefficients indicate significant relations between most of the subscales and the performance measures. For the combined sample of men and women, only Coachability was unrelated to performance in the seasonal model, and four of the seven subscales were significant in the tournament model.

## Gender Effects

The significant gender effects shown on both the performance measures and several of the ACSI scales, plus our desire to assess potential gender effects in coping skill-performance relations, dictated separate data analyses for men and women. As shown in the first data column of Table 3, the M-CSDS correlated significantly with many of the ACSI subscales and with the ACSI total score for both men and women. It also accounted for little performance variance, thereby qualifying it as a potential suppressor variable (Conger, 1974; Tzelgov & Henik, 1991).

The significant beta-in coefficients shown in Table 2 are for the total sample and therefore do not reveal gender differences that might exist. Bivariate product moment correlations also show the direct relations between each subscale and performance, and they are shown in Table 3. Negative correlations indicate relations with better performance. These analyses revealed both similarities and differences between men and women. For men, the bivariate correlations yielded significant relations between regular-season and tournament stroke averages and three of the seven ACSI subscales (Confidence and Achievement Motivation, Concentration, and Goal Setting and Mental Preparation). For women, three of the seven ACSI subscales (Confidence and Achievement Motivation, Coping with Adversity, and Peaking under Pressure) yielded significant bivariate correlations. The Goal Setting and Mental Preparation subscale, not significant during the regular season, emerged as a significant predictor of postseason tournament performance for the

Table 3
*Bivariate (r) and SD-Controlled Semipartial Correlations of ACSI Scores With Stroke Averages for Men and Women During the Regular Golf Season and the Postseason Tournament*

| Period and ACSI subscale | M-CSDS/ACSI correlation | | Men | | Women | |
|---|---|---|---|---|---|---|
| | Men | Women | *r* | Semipartial *r* | *r* | Semipartial *r* |
| Regular season | | | | | | |
| Coachability | .25 | .33* | −.17 | −.11 | .07 | .04 |
| Concentration | .29* | .21 | −.37** | −.46** | −.21 | −.24 |
| Confidence and Achievement Motivation | .31* | .31* | −.43** | −.51** | −.33* | −.38** |
| Coping with Adversity | .27* | .32* | .02 | −.02 | −.29* | −.34* |
| Goal Setting and Mental Preparation | .19 | .44** | −.31* | −.33* | −.27 | −.34* |
| Peaking under Pressure | .21 | .15 | −.22 | −.26 | −.47** | −.49** |
| Freedom from Worry | .28* | .33* | −.17 | −.21 | −.22 | −.27 |
| Total score | .40** | .42** | −.29* | −.40** | −.38** | −.46** |
| Postseason tournament | | | | | | |
| Coachability | | | .11 | .04 | .05 | .04 |
| Concentration | | | −.29** | −.41** | −.17 | −.18 |
| Confidence and Achievement Motivation | | | −.37** | −.48** | −.30* | −.34* |
| Coping with Adversity | | | .10 | .03 | −.28* | −.31* |
| Goal Setting and Mental Preparation | | | −.30* | −.35** | −.25* | −.30* |
| Peaking under Pressure | | | −.18 | −.24 | −.29* | −.29* |
| Freedom from Worry | | | −.05 | −.11 | −.17 | −.20 |
| Total score | | | −.21 | −.35** | −.31* | −.36** |

*Note.* Lower stroke average scores denote better performance, resulting in negative correlations between coping skills scales and performance. SD = social desirability; ACSI = Athletic Coping Skills Inventory-28; M-CSDS = Marlowe-Crowne Social Desirability Scale.
* $p < .05$. ** $p < .01$.

women. The Personal Coping Resources total score was a significant predictor of both regular-season and tournament stroke averages for women but was not a significant predictor of tournament performance for men.

### Suppressor Effects of Social Desirability

Following standard procedures for assessing suppressor effects (Conger, 1974; Tzelgov & Henik, 1991), we compared the bivariate correlations shown in Table 2 with semipartial (part) correlations derived from a series of separate hierarchical regression analyses involving each ACSI subscale score, as well as the Personal Coping Resources score. When a suppressor effect is present, a semipartial correlation derived by controlling for the suppressor will be larger than its corresponding zero-order correlation (Velicer, 1978). In the hierarchical models, the semipartial correlations were obtained by entering M-CSDS scores at Step 1, followed by one of the individual ACSI subscale scores. Semipartial correlations rather than partial correlations are reported because they controlled for SD variance only in the self-report measure and not the behavioral one. Additionally, squared semipartial correlations show the amount of accountable variance independently associated with each subscale (Velicer, 1978).

As shown in Table 3, the semipartial correlations controlling for SD increased subscale relations with performance to varying degrees except for Coachability, which was not significantly related to performance in any analysis. With SD variance suppressed, five of the seven ACSI subscales (Concentration, Confidence and Achievement Motivation, Goal Setting and Mental Preparation, Peaking under Pressure, and Freedom from Worry) that had achieved bivariate statistical significance showed increases in performance variance ranging from 31% to 100%. Controlling for SD increased the amount of regular-season stroke variance accounted for by the Personal Coping Resources score from a nonsignificant 6.25% to a significant 16%, and tournament score variance from 5.8% to 13% for men and from 14.4% to 21.1% for women for both the regular season and the tournament.

Although improvements in the predictive power of a model rather than statistically significant differences between bivariate and semipartial correlations define a suppressor effect, particularly in underpowered small samples (Conger, 1974; Tzelgov & Henik, 1991), we undertook additional analyses to determine whether the performance variance accounted for by ACSI scores was significantly increased by controlling for SD. We conducted pairs of regression analyses in which the seven coping subscales as a group served as a predictor variable for either regular-season or tournament performance. In one analysis in each pair, performance scores were regressed on the block of seven ACSI subscales without controlling for SD. In the second, M-CSDS scores were entered first in a hierarchical model, followed by the seven ACSI subscales entered simultaneously. This procedure allowed for $F$ tests of $R^2$ increments when SD variance was statistically controlled.

Whether or not SD was controlled, the combined ACSI subscales accounted for significant amounts of performance variance in three of the four analyses. The exception was the women's performance in the postseason tournament, in which the combination of ACSI subscales did not achieve significance whether or not SD was controlled. In all cases, however, accountable performance variance ($R^2$) and $p$ values increased when SD variance was extracted. Utilizing the analysis described by Cohen et al. (2003, p. 171), we assessed the statistical significance of differences between the multiple regression analyses and the hierarchical ones that controlled for M-CSDS. The $R^2$ increment (from 32% to 38%) for men's regular-season performance when SD was controlled was significant, $F(1, 44) = 4.26$, $p = .045$, as was the increment in $R^2$ for tournament performance (27% to 39%), $F(1, 44) = 8.82$, $p = .005$. Although the increments of 6% for women were identical to the regular-season results for men, the observed increments in performance variance (from 29% to 35%) in the somewhat smaller sample of women approached but did not achieve significance for either the regular season, $F(1, 41) = 3.77$, $p = .058$, or the tournament, $F(1, 41) = 3.24$, $p = .078$. Thus, by the more stringent criterion of statistically

significant increments in $R^2$, stronger suppression effects occurred for men than for women when considering the combination of ACSI subscales.

## Discussion

### Coping Skills and Performance

As in previous studies, (e.g., Daroglou, 2011; Karamousalidis et al., 2006; Smith & Christensen, 1995), we found significant relations between ACSI subscales, the more global Personal Coping Resources score, and athletic performance. On the basis of effect size benchmarks suggested by Cohen et al. (2003), where correlations of .10, .30, and .50 signify small, moderate, and large effect sizes, respectively, most of the significant ACSI correlations with performance fell into the moderate range, and all did when SD was controlled.

Supporting assertions by Bandura (1997) and Lazarus (2000) that effectiveness of strategy application is a critical factor in coping outcomes, the substantial amount of objective performance variance accounted for by the seven ACSI subscales in this and previous studies (e.g., Smith & Christensen, 1995) exceeds that accounted for by coping strategy measures that explicitly avoid reference to outcomes or effectiveness (cf. Doron & Gaudreau, 2014; Gaudreau et al., 2010). In fairness, however, we should point out that the coping strategy measures were designed to study the *process* of coping in a situation-specific fashion, so that the comparison with the outcome-oriented dispositional skills measure we used is not strictly appropriate. Moreover, the situation-specific ways of coping measures have not been related to objective performance in longitudinal studies like the present one and that done by Smith and Christensen (1995). However, a dispositional form of the CICS has now been developed (Hurst, Thompson, Visek, Fisher, & Gaudreau, 2011). Comparative research involving the dispositional CICS, the ACSI, and the TOPS 2 measure (Hardy et al., 2010) would provide a more appropriate comparison of the two measurement strategies for predicting performance.

In a relative sense that reflects on the influence of the coping attributes assessed by the ACSI and on its construct validity, the mean performance $R^2$ of .34 obtained in this study and the mean $R^2$ of .30 in baseball performance (after controlling for experts' ratings of physical skills) reported by Smith and Christensen (1995) exceeds that accounted for by other influential sport-related psychological variables, such as self-efficacy and anxiety. For example, a meta-analysis based on 84 correlations between self-efficacy and objective sport performance measures yielded a mean correlation of .34, accounting for 11.6% of performance variance (Moritz, Feltz, Fahrbach, & Mack, 2000). Performance variance accounted for in this and other ACSI studies also exceeds the 3.61% of shared variance found between anxiety and sport performance in a meta-analysis involving 77 independent samples (Kleine, 1990).

### Suppressor and Attenuation Effects of Social Desirability

Across regular-season and postseason tournament play, performance variance accounted for by the coping skill subscales increased on average from 30% to 39% for men and from 23% to 30% for women with SD controlled. It is well established that SD, particularly the variety known as impression management (Paulhus, 1984) or "other deception" (Sackeim & Gur, 1979), can influence relations between self-report measures and other variables. This influence can either enhance or attenuate relations, depending on the extent to which the particular measures are influenced by this response set. When two self-report variables are both saturated with SD variance, correlations between them will be inflated by this component of shared variance, and controlling for SD will result in an attenuation of the relation. For example, Grossbard, Cumming, Standage, Smith, and Smoll (2007) found that M-CSDS scores were negatively correlated with measures of ego achievement goal orientation ($r = -.44$) and performance anxiety ($r = -.36$). When SD scores were partialed out, however, the correlation between ego goal orientation and anxiety decreased from $+.44$ to $+.30$, reducing shared variance from 16.8% to 9%. To reduce the possibility of Type I errors, one should assess SD correlations with measures and statistically control SD variance if necessary.

As in this study, an entirely different effect can occur when a self-report variable is saturated with SD variance, whereas other variables of interest, such as a behavioral or medical one, are not. In this study, for example, SD functioned as a suppressor variable whose control strengthened the relation between the predictor and the outcome

variable. In another study, controlling for M-CSDS scores caused a previously nonsignificant coping skills effect to become highly significant in predicting stress-related injury time loss (Wiechman et al., 2000). From a scientific perspective, a successful suppressor variable can reduce the likelihood of committing Type II errors (i.e., mistakenly concluding that an effect is not present) by revealing significant relations that would otherwise have been masked by systematic error variance. In the present study, for example, the Personal Coping Resources score, nonsignificant in the men's bivariate correlation with postseason tournament performance, became a significant predictor variable with SD variance extracted, increasing accountable performance variance from 4.4% to 12.3%.

Social desirability as a construct has been a topic of theoretical and empirical attention since Frenkel-Brunswik (1939) differentiated between conscious dissimulation and unconscious self-deception. Factor analyses have revealed two independent factors labeled *impression management* and *self-deception.* Impression management (faking good) involves a conscious attempt to project a positive image to others that is known to be at least partially false, whereas self-deception involves the belief that one's positive self-report is true and accurate (Paulhus, 1984). The impression management variant should always be eliminated if possible as a source of systematic error variance. In contrast, self-deception (or "positive self-illusions") is a meaningful component of many positive psychological constructs, such as self-esteem, self-efficacy, and internal locus of control. Removing this form of self-enhancing bias from self-report data can actually detract from a scale's construct and predictive validity (Nunnally & Bernstein, 1994; Paulhus, 1984).

Item- and scale-level factor analyses have revealed that although the M-CSDS loads on both factors, its impression management loading is substantially higher than its self-deception loading and the M-CSDS correlates more highly with other impression management measures than with self-deception scales (Paulhus, 1984). Moreover, M-CSDS scores are significantly elevated under high-identifiability, nonanonymous conditions that would be expected to motivate impression management, whereas self-deception measures are not affected in this manner (Paulhus, 1984). Smith and Christensen (1995) reported that on average, ACSI correlations with the M-CSDS are invariably higher under conditions of personal identifiability than under conditions of anonymity. Given that athletes identified themselves by name in this study so that their questionnaire responses could be matched to their performance statistics, we favor an impression-management interpretation of M-CSDS scores in this study.

## Gender Effects

Commonalities and differences were shown for men and women. As shown in Table 2, with SD controlled, the Personal Coping Resources total score was significantly related to performance for both men and women in both the regular season and the tournament, accounting for 12%–16% of performance variance for the men and 13%–21% for the women. Among the subscales, Confidence and Achievement Motivation and Goal Setting and Mental Preparation were significant predictors for both men and women. In contrast, Concentration was an important predictor for men but not for women. Peaking under Pressure and Coping with Adversity yielded significant relations with performance for women but not for men.

As Taylor et al. (2008) have noted, little is known about gender differences in coping skills-performance relationships, and future theory development awaits evidence of replicable differences. A substantial body of "ways of coping" research has shown that when confronted with stressors, including sport-related ones, women are more likely to choose emotion-focused coping strategies than are men, whereas men are more problem-focused than are women (Anshel et al., 2009; Tamres et al., 2002). However, much less is known about how *effectively* these favored strategies are applied by men and women (Tamres et al., 2002). Though any interpretation must be regarded as highly tentative given the current database, if Peaking under Pressure and Coping with Adversity are considered to be relatively more emotion-focused than problem-focused, this gender difference might suggest that emotion-regulation skills are more strongly predictive of performance for women than for men. Also noteworthy, however, is the fact that women reported significantly lower skill levels than did men and exhibited more variability on these scales. Enhancing emotion-regulation skills may be an especially important focus of psychological skills training for

women, given their general strategy preferences.

## Limitations and Conclusions

Although our performance data contain a rather substantial behavior sample for the regular season (a mean of 234 holes for men and 174 for women), our sample of tournament behavior is much smaller (72 holes for men and 54 for women) and therefore less stable. From our available sample of 189 golfers, we restricted our analyses to the 53 men and 50 women who performed extensively during the season and competed in the tournament that led to the national finals (i.e., the most talented athletes). We did this in order to maximize the regular-season behavior sample and to compare the two performance situations, assuming that because the tournament would impose more pressure on athletes, psychological skills might be more-influential predictors during the tournament (an assumption that was not supported by our results). On the one hand, restricting our sample to the best golfers on each team reduced not only statistical power but also performance variance, so that range restriction in stroke average could have reduced somewhat the obtained relations between coping skills and performance. On the other hand, range restriction in ability level might be expected to increase the influence of psychological factors. We cannot be sure which of these two possibilities might have influenced our results.

As once again shown in this study, the ACSI Personal Coping Resources total score appears to have reasonable construct validity as a summary index of performance enhancement attributes, and it is suitable as a predictor variable not only in its own right but also when a single index is desirable for structural equation and moderator variable analyses (e.g., Smith & Christensen, 1995). There is, however, a need for additional construct validity evidence in relation to the individual scales. One supportive example is Mummery et al.'s (2004) finding that "resilient" athletes who recovered from initial poor performance to perform well subsequently scored higher than those who did not on the Coping with Adversity and Peaking under Pressure subscales. More construct validity studies of the individual subscales are needed. For example, such research might assess the extent to which the score on the goal-setting subscale relates to behavioral measures of goal-setting ability.

It should be noted that, as measures derived through factor analysis, the ACSI subscales are statistically defined and therefore less homogeneous in nature than are scales derived using a supplementary rational–intuitive strategy to add items, such as the TOPS 2 (Thomas et al., 1999). As a result, the ACSI maps less directly onto the specific skills that are typically the focus of psychological skills training in sport than does the TOPS. For example, only one item (found on the Coping with Adversity scale) refers directly to somatic relaxation. Moreover, the use of mental imagery is represented only implicitly on the items that refer to planning for competition. Finally, none of the scales discussed in this article, including the ACSI, assess coping skills that are at the forefront of current developments in emotion regulation, such as acceptance, mindfulness, and defusion (Farb, Anderson, Irving, & Segal, 2014; Gardner & Moore, 2007).

Though related to a variety of sport-related phenomena, the ACSI and other coping measures address only one segment of the psychological spectrum, and other psychological factors are certain to be involved in sport behavior and outcomes. The contribution of psychological influences to sport performance is surely underestimated in this as in other single-variable studies. A more-comprehensive assessment of psychological influences requires studies in which additional construct measures are applied conjointly as predictor variables, perhaps within structural equation models in which they define a "psychological" latent variable.

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