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Self-Efficacy, Cognitive Interference, Sport Anxiety, and Psychological Coping Skills as Predictors of Performance in Intercollegiate Golf

by

Donald Steven Christensen

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of the requirements for the degree of

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Reading Committee: Frank L. Smoll

Robert D. Abbott

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University of Washington

Abstract

Self-Efficacy, Cognitive Interference, Sport Anxiety, and Psychological Skills as Predictors of Performance in Intercollegiate Golf

by Donald Steven Christensen

Chairperson of the Supervisory Committee:

Professor Ronald E. Smith
Department of Psychology

The present study examined the importance of four psychological constructs, self-efficacy, cognitive interference, sport anxiety, and psychological coping skills, in predicting the performance of 117 men and 79 women intercollegiate golfers in the Pacific-10 Athletic Conference. Prior to the start of the 1997 spring intercollegiate golf season, members of all men's and women's teams in the conference completed a questionnaire which included trait measures of self-efficacy, sport anxiety, athletic coping skills, and social desirability. The coaches at each of these schools rated each of their players' psychological and physical abilities as well using separate rating instruments. At the men's and women's Pac-10 Conference Championships, additional state measures of self-efficacy and cognitive interference were gathered. Outcome measures included the participant's spring tournament stroke average and number of competitive rounds completed. In addition, total score, total birdies (one under par on a hole) or better, and total double-bogeys (two over par on a hole) or worse were calculated for the 60 men and 50 women who participated in the Pac-10 Tournament. Results revealed that each of main psychological factors was significantly correlated with golf

performance for men and women. Furthermore, when social desirability ratings were partialed out, correlations of psychological factors with performance were almost universally strengthened. Several of the measures maintained significant correlations with performance even after a measure of physical ability was statistically controlled. Discriminant function analyses revealed that each of the measures was also effective at discriminating the men who participated in the Pac-10 Tournament from those who didn't but similar analyses for the women were not significant. Structural equation modeling provided tentative support for the causal influence of these psychological factors on performance. The implications of this study for future research are discussed.

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CHAPTER 1: INTRODUCTION

How can athletic performance be predicted and what constructs or combination of constructs are associated with successful sport outcomes? No doubt physical ability plays an important role. It makes intuitive sense that on average, athletes with more physical talent are going to perform better than those with lesser physical skills. However, physical skills do not appear to account for everything. Every sport has seen instances, which occur on a fairly regular basis, where athletes or teams are defeated by clearly less physically gifted opponents. While not discounting the role of chance in these occurrences, it is likely that mental or psychological factors are involved. The present study is designed to investigate the role of and the relations between four such psychological factors: self-efficacy, cognitive interference, sport anxiety, and psychological coping skills.

Self-Efficacy

Arguably, no single psychological variable has predicted performance outcomes as well as self-efficacy. In a wide range of athletic and non-athletic settings and with diverse populations, self-efficacy has consistently proven itself a reliable and significant predictor of behavioral outcomes and performance (Bandura, 1995; 1997; Schwarzer, 1992a).

Self-efficacy refers to perceptions or appraisals of one's ability to attain a specified level or type of performance in a given setting (Cervone & Scott, 1995). Self-efficacy can also be described as the conviction that one can successfully execute a behavior required to produce a certain outcome (Bandura, 1977). Generally, self-efficacy

appraisals are seen as having two components: the level of the appraisal and the strength of the appraisal. The level of the appraisal, as the name implies, refers to level of attainment the person believes he or she can achieve, while the strength of the appraisal concerns how confident the person is in this efficacy belief.

Bandura's original conceptualization of self-efficacy also included the generalizability of the appraisal to other domains (Bandura, 1977) but this dimension was not emphasized in most later theorizing on the topic. Some still argue for the importance of the dimension (see Smith, 1989) and Bandura has addressed the issue again in one of his recent publications (Bandura 1997). He acknowledges that self-efficacy *appraisals* can generalize to other areas and discusses several factors that can impact whether this type of generalization occurs, such as the learning of skills concurrently, the similarity between domains, and the cultivation of generalizable coping skills. However, Bandura remains outspoken on the topic of the generality of *assessment*. In particular, he is critical of the vagueness and lack of predictive validity of global or omnibus measures such as locus of control. Despite his stance on this issue, Bandura does allow for some variation in generality even in assessment, stating that, "domain particularity does not necessarily mean behavioral specificity (p. 49)." In other words, self-efficacy judgements can vary from specific to general within a given domain area. Thus, Bandura does not condone the extreme generality of trait-like measures but allows for the variation in generality of assessment within a given domain.

Various sources of self-efficacy include enactive attainments (i.e. actual performances), vicarious experiences (such as watching or imagining someone else perform), verbal persuasion, and physiological arousal. Of these, enactive attainments are thought to be the most important sources of efficacy judgments. In particular, *appraisals* of enactive attainments are thought to play the critical role in determining self-

efficacy. For instance, an individual can experience a successful performance, but if he attributes it to luck, he is unlikely to experience any positive changes in self-efficacy. Some of the different aspects of functioning which self-efficacy is theoretically thought to influence are choice of activities, task persistence, learning and preparation, performance, and affective reactions prior to and during performance.

Research on self-efficacy has shown it to be a powerful predictor in a variety of settings including the treatment of phobias (Williams, 1992), stress management (Schwarzer, 1992b), addictive behaviors (Marlatt, Baer, & Quigley, 1995), chronic disease (Holman & Lorig, 1992), and recovery from heart attacks (Ewart, 1992). A series of studies conducted in the late 1970's and early 1980's examined the role of self-efficacy in athletic performance. Feltz, Landers, and Raeder (1979) examined the effects of three different kinds of modeling on neophyte divers performing a back dive. Weinberg, Gould, Yukelson, and Jackson (1981) related self-efficacy to performance on a physical task and examined the effect of self-efficacy both as a subject characteristic and as a manipulated experimental variable. Barling and Abel (1983) examined the importance of self-efficacy with a group of active tennis players. In all of these studies, self-efficacy was found to be a significant and important predictor of performance.

Cognitive Interference and Sport Anxiety

Another psychological construct that has more recently been shown to be a relevant predictor of performance is cognitive interference. Cognitive interference (Sarason, Sarason, Keefe, Hayes, & Shearin, 1986; Sarason, Pierce, & Sarason, 1996) refers to intrusive or disruptive thoughts that an individual can experience while executing a given behavior or task. Key definitional elements of cognitive interference include that these

thoughts are typically concerned with worry, are internally generated, and that the person is usually aware or conscious of them (Yee & Vaughan, 1996). Like other psychological constructs such as anxiety, cognitive interference can be conceptualized as either a trait-like, general tendency or a situationally dependent, state-like variable (Yee & Vaughan, 1996; Sarason et al., 1986). Research has demonstrated that cognitive interference, measured as either a trait or a state variable, is a significant correlate of performance (Sarason et al., 1986).

There are several theoretical explanations as to why cognitive interference has a deleterious effect on performance. Carver (1996) interprets the effects of cognitive interference relative to a behavioral self-regulation model, an approach that emphasizes goal-directedness and information-processing. In this model, cognitive interference is detrimental to performance because it focuses attention on inappropriate goals and disrupts our ability to process relevant information. Alternatively, Klinger (1996) sees cognitive interference as a dysfunctional consequence of normally adaptive thought regulation mechanisms. Sarason et al. (1986) offer a more straight-forward interpretation of the causal effect of cognitive interference, asserting that it "keeps the individual from directing sufficient attention to the task at hand (p.216)."

While much of the research on cognitive interference has been conducted in non-athletic contexts (primarily focusing on test anxious individuals and using intellective tasks), evidences exists of the importance of this factor in sport settings. Smith (1996) discusses the relevance of cognitive interference to athletic performance, anxiety, and concentration. He points out how several constructs in the field of sport anxiety research appear to assess specific aspects of cognitive interference. For instance, Smith reviews research on the Competitive State Anxiety Inventory-2 (CSAI-2; Martens, Vealey, & Burton, 1996), a state measure of anxiety that contains three different subscales:

cognitive anxiety, somatic anxiety, and self-confidence. Research using this scale conducted with college and elite swimmers (Burton, 1988) revealed that the cognitive anxiety subscale (presumably measuring a specific type of cognitive interference) was negatively related to performance. Other studies have found similar correlations between cognitive anxiety and performance with a different sample of collegiate swimmers (Barnes, Sime, Dienstbier, & Plake, 1986), gymnasts (Kolt & Kirkby, 1994), cyclists (McCann, Murphy, & Raedeke, 1992), and soccer players (Rodrigo, Lusiardo, & Perseira, 1990). However, the association between cognitive anxiety and performance is not entirely consistent, as there are several studies that have failed to find this relationship (Terry & Slade, 1995; Maynard & Howe, 1987; Gould, Petlichkoff, Simons, & Vevera 1987).

Smith (1996) also reviewed research on his own trait measure of anxiety, the Sport Anxiety Scale (SAS; Smith, Smoll, & Schutz, 1990). Like the CSAI-2, this measure also has three subscales: somatic anxiety, worry, and concentration disruption. The latter two of these subscales appear to assess particular aspects of cognitive interference. Tests of the SAS with collegiate football players demonstrated that the concentration disruption subscale had a significant, negative relation with performance.

While the research evidence in not as strong as is the case for self-efficacy, the review above suggests that cognitive interference, primarily assessed by subscales of state and trait anxiety measures, appears to have detrimental effect on sport performance. One shortcoming of research in this area is that cognitive interference has been assessed primarily by measures originally intended to measure anxiety. A review of the literature produced only one study which attempted to assess cognitive interference directly in a sport context (Man, Stuchlikova, & Kindlmann, 1995), and this study failed to yield significant results with its measure.

Psychological Coping Skills

Psychological coping skills, such as the ability to relax under pressure, concentrate amidst distraction, or remain confident during adversity, are another set of factors that are assumed to be good predictors of performance. I say "assumed" because the research evidence demonstrating the importance of these factors is rather different from the self-efficacy and cognitive interference research discussed above. Most of the evidence supporting the importance of these mental factors is derived from qualitative research on peak performance and peak performers.

Research on athletes' recollections of exceptional performances (Loehr, 1986; Ravizza, 1977; Cohn, 1991) and on the psychological characteristics of highly successful athletes (McCaffrey & Orlick, 1989; Gould, Weiss, & Weinberg, 1981; Highlen & Bennett, 1983; Mahoney, Gabriel, & Perkins 1987; Williams & Krane, 1993) has enhanced researchers' understanding of peak performance, peak performers and psychological coping skills. Results from research on athletes' recollections of past performances suggest that they experience a unique psychological state during peak performances. A study conducted by Cohn (1991) attempted to examine the characteristics of peak performance in golf. The participants were 19 professional and intercollegiate golfers who participated in open-ended interviews where they discussed past successful performances. Content analysis of the interviews suggested that there were indeed certain psychological experiences that were similar across individuals during peak performance. Some of these qualities were that they felt highly focused and immersed in the task at hand, performed effortlessly and without much thought, felt relaxed and mentally calm, and felt in control of both themselves and their performance.

Thus it seems that, as in other sports, peak performance in golf appears to consist of a more or less specific set of psychological experiences.

Studies examining the mental characteristics of successful athletes have been equally enlightening. Research in this area suggests that successful athletes may possess certain "mental skills" that are similar to their more readily identifiable physical skills. Furthermore, these mental skills appear to make important contributions to athletic success. For instance, a study conducted by McCaffrey and Orlick (1989) examined the mental preparation strategies of top men and women professional golfers. Open-ended interviews were conducted and the athletes' responses were grouped into categories. Among the characteristics of the highly successful touring pros were total commitment, an emphasis on quality practice, imagery practice, goal setting, tournament plans, and post-competition evaluation. Touring professionals were then compared to less accomplished club professionals to determine if and where differences occurred. On almost all of the characteristics mentioned by touring pros, the club pros were found to differ. For example, the club pros lacked total commitment to the game and used specific goals much less frequently. Thus, not surprisingly, differences appeared to exist between touring and club pros on this set of mental preparation strategies.

The research reviewed above suggests that there are unique psychological aspects of peak performance and that successful athletes may possess certain mental skills that enable them to experience these peak moments more frequently (or, as proposed by Ravizza and Hanson (1995), allow them to elude the particularly negative states that do not facilitate good performance). These different mental characteristics of the successful athlete are frequently considered to be indicators of the underlying construct of "mental toughness" (Loehr, 1986). Research on exceptional athletes can thus be viewed as

contributing to our understanding of what the mentally tough athlete "looks like" from a psychological perspective.

A great deal of emphasis has been given to the importance of mental skills in sport and a relatively large number of psychological skills intervention studies have been conducted (see Whelan, Mahoney & Meyers, 1991 and Greenspan & Feltz, 1989 for reviews). However, unlike self-efficacy, there have been comparatively few studies demonstrating the predictive utility of such factors. Smith and Christensen (1995) conducted a recent study demonstrating the predictive significance of psychological coping skills. The participants in this study were professional baseball players on five minor league teams, all belonging to the same professional organization. During spring training, prior to the start of the 1991 minor league season, players competed the Athletic Coping Skills Inventory-28 (ACSI-28; Smith, Schutz, Smoll, & Ptacek, 1995), a self-report questionnaire designed to assess seven different sport-related psychological skills: Coping with Adversity, Coachability, Concentration, Confidence and Achievement Motivation, Goal Setting and Mental Preparation, Peaking under Pressure, and Control of Worry. In addition, coaches and managers who had coached these athletes the previous season were asked to rate each athlete using the ACSI Rating Form, a questionnaire assessing these same seven psychological skills in a definitional format.

A unique feature of this study was that it included a measure of physical ability. The athletes' physical skills were assessed using an organizational measure called the Overall Average Evaluation (OAE). This single rating represented a measure of the athlete's overall major league potential and was based on ratings of specific skills by managers, coaches, and roving minor league instructors. Each specific skill was rated on an 8-point scale. Thus, each athlete's psychological and physical skills were assessed. At

the conclusion of the season, batting average and earned run average (ERA) statistics were collected.

Preliminary analyses revealed that the psychological and physical skill measures were relatively uncorrelated with one another. Subsequent analyses revealed that for position players, both the psychological (as rated by the coaches) and physical skill measures were significantly correlated with batting average. Hierarchical regression analyses revealed that psychological factors (as rated by the coaches and the players themselves) accounted for significant additional proportions of variation in batting average, after physical ability had been statistically controlled. For the pitchers, a slightly different pattern of results emerged. Specifically, the physical skill measure was not significantly associated with performance, as measured by earned run average. However, in hierarchical regression analyses, scores on both the ACSI-28 and the ACSI Rating Form accounted for significant additional proportions of variation in ERA after physical skill had been statistically controlled.

Survival in the sport, defined as continued participation in professional baseball, was assessed at two and three year intervals. Discriminant function analyses were performed to determine if any of the predictor variables could be used to identify those individuals who survived. Results revealed that both the physical and psychological measures could significantly discriminate between those who survived and those who did not. Bayesean hit rate analyses of the same data yielded similar conclusions. Thus, while the evidence is much less clear than is the case with self-efficacy or even cognitive interference, psychological coping skills appear to be significantly associated with performance. More research on this collection of constructs is needed to further establish their predictive utility.

Relations between Psychological Constructs

While the majority of the research reviewed above has concentrated on the main effects of single constructs, the present study includes several theoretically important variables and allowed for the examination of relations among these variables. One theoretically interesting question concerns the specific relationship between self-efficacy and cognitive interference. The obvious prediction is that these two constructs should be negatively correlated. Beyond this, there are at least two more specific relationships that seem possible. It may be that individuals with high self-efficacy are susceptible to a different kind of cognitive interference than individuals with low self-efficacy. For instance, high self-efficacy individuals could be more distracted by thoughts of performing well while people with low self-efficacy may be more prone to worrying and thinking about negative outcomes. Alternatively, differences in cognitive interference between athletes with high or low self-efficacy may be more quantitative in nature, with low self-efficacy individuals simply experiencing more cognitive interference. In order to address this issue, the state measure of cognitive interference created for this study includes several items intended to reflect "positive" distracting thoughts, something which seems to have not been assessed by previous measures of cognitive interference.

Another theoretically meaningful issue concerns the relation between self-efficacy and psychological coping skills. Do athletes with high self-efficacy use different psychological coping skills than athletes with lower efficacy and are these differences qualitative or quantitative in nature? In other words, do high self-efficacy athletes use a

different set of coping skills or do they instead use more or less of the same coping skills?

The Present Study

The present study had several goals. It was designed to replicate and extend the Smith and Christensen (1995) study using intercollegiate golfers as participants. Frequently research assessing the importance of psychological factors in golf has been qualitative and retrospective in nature (e.g., Cohn, 1991; McCaffrey & Orlick, 1989). The present study, however, was designed to provide more quantitative results and to examine the correlates of future performance. As was done in the Smith and Christensen study, the methodology permitted the assessment of the importance of psychological coping skills after physical ability was statistically controlled. Similar analyses were used to document the presumably positive effect of self-efficacy and the negative effects of cognitive interference and sport anxiety on golf performance. Furthermore, the design of the permitted an examination of relations between these four psychological constructs, something that has yet to be addressed. The present study also assessed the importance of social desirability with regard to each of these sets of psychological variables to determine the potential masking effect of this variable. It is possible that previous studies utilizing self-report measures have missed significant relations between psychological variables and athletic performance by failing to take social desirability into account. Finally, while research has been conducted assessing the importance of cognitive interference as measured by subscales of anxiety measures, this was one of the few studies designed to examine the importance of cognitive interference in the area of sport using a measure specifically designed to assess cognitive interference.

CHAPTER 2: METHOD

Participants

Participants were selected from a possible pool of 117 male and 79 female college golfers from the 10 member schools of the Pacific-10 Athletic Conference. When contacted by phone, all men's and women's coaches in the conference agreed to allow their teams to participate. Individual consent to participate was gathered at team meetings conducted by the author. Six males (5%) and 1 female (1%) did not participate in the study due to their absence on day that the initial questionnaires were completed, leaving 111 male and 78 female participants. Of those who participated in this phase of the study, 97% of the men and 100% of the woman provided complete questionnaire data. However, only 72% of the men and 86% of the woman managed to play at least one tournament round during the spring intercollegiate golf season. Participants ranged in age from 18 to 22 and had the following ethnicities: Anglo/Caucasian: 87%, Asian/Pacific Islander/East Indian: 9%, Latino/Latina: 4%. Fourteen percent of the participants (8 men and 19 women) originated from countries outside of the United States (Australia: 1, Canada: 6, Columbia: 1, England: 2, France: 3, Germany: 1, Ireland: 1, New Zealand: 3, Scotland: 1, Sri Lanka: 1, Sweden: 6).

Measures

Self-Efficacy. Two new self-efficacy measures were created specifically for use in this study and were modeled after self-efficacy measures created by Holman and Lorig (1992). The Trait Golf Self-Efficacy scale (Appendix B) consists of 14 items and is intended to be a measure of general golf skill self-efficacy. It asks participants to rate

their confidence (from "not at all confident" to "completely confident") in their ability to execute a variety of golf skills such as their ability to make six foot putts or to hit their short irons within 15 feet of the hole. The State Golf Self-Efficacy scale (Appendix H) consists of the same 14 items, but instead of asking how participants generally feel about their abilities in each of the designated areas, asks how they feel about them at the current moment in time.

Cognitive Interference. Cognitive interference as a general trait was assessed by the concentration disruption and worry subscales of the SAS (Smith, Smoll, & Schutz, 1990; Appendix F). While the review above focused on the CSAI-2 (Martens et al., 1990) as a state measure of cognitive interference, a new measure was created for the current study. This was done because the CSAI-2 was originally intended to assess state anxiety and it was thought that using a golf-specific measure to assess cognitive interference would be more appropriate. Based on the CIQ (Sarason et al., 1986), the Cognitive Interference Questionnaire for Golfers (Appendix I) was created and consisted of 15 items that concern different thoughts golfers may encounter while competing. The questionnaire includes statements such as, "I worried about what my teammates thought of me" and "I thought about how badly I was playing." The questionnaire also contains examples of both negative ("I worried about what my coach thought of me") and positive ("I thought about what it would be like to win or finish high in the tournament") intrusive thoughts. For each statement, the athletes were asked to indicate on a five-point scale ("Never" to "Very Often") how often each thought occurred during the tournament they just completed.

Psychological Skills. Psychological skills were assessed using the Athletic Coping Skills Inventory-28 (ACSI-28; Smith, Schutz, Smoll, & Ptacek, 1995; Appendix E), a 28 item self-report questionnaire (Smith, Smoll, & Ptacek, 1990; Smith, Ptacek, & Smoll,

1992). Derived through exploratory and confirmatory factor analysis, the ACSI-28 consists of seven, 4-item psychological coping skill subscales: Coping with Adversity, Coachability, Concentration, Confidence and Achievement Motivation, Goal Setting and Mental Preparation, Peaking under Pressure, and Control of Worry. The individual items or the subscale scores can be summed to create a Personal Coping Resources score for an individual. Internal consistency (Chronbach's alpha) of the seven subscales ranges from .61 to .79 and the total scale has an alpha of .90.

A second measure of each athlete's psychological skills was obtained by asking their coaches to rate each athlete's psychological skills as well. Rather than having the coach complete the full ACSI-28 for each player, the shorter ACSI Rating Form was used (Smith & Christensen, 1995; Appendix F). This rating form was constructed using a definitional approach in which the items that comprise the longer scale are summarized into a brief paragraph describing the construct; respondents then provide a single rating based on the definitional description. This methodology has been successfully utilized in other studies of the coping process (e.g. Ptacek, Smith, & Zanas, 1992; Stone & Neal, 1984; Smith & Christensen, 1995). The convergent validity of this approach has been demonstrated (Ptacek, Smith, Espe, & Raffety, 1994), though the convergent validity of this particular measure with the ACSI-28 in the Smith and Christensen (1995) study was poor.

Social Desirability. Social desirability was assessed by a 13 item short form of the Marlowe-Crowne scale developed by Reynolds (1982; Appendix E). This instrument correlates .93 with the long form of the Marlowe-Crowne (Reynolds, 1982). The Marlowe-Crowne has been found to load significantly on the factors of impression management and self-deception (Paulhus, 1986).

Physical Ability. To assess each subject's golf technique and physical ability, the Physical Skills Rating form was created (See appendix G). Using a seven-point rating scale, coaches were asked to assess each golfer on a variety of physical and technical aspects of their games: putting, short game, and long game. When making these ratings, coaches are asked to consider the subject's performance in practice and non-competitive situations. Pilot testing of this measure with a group of 27 high school golfers who were rated by their coaches indicated that the total measure correlated significantly ($r = -.82$) with performance in a two-round tournament, suggesting good predictive validity.

Performance Data. Data from the latter half of the 1996-97 intercollegiate golf season were used to assess the participants' performance. Stroke average and the number of competitive rounds completed were the two primary measures of golf performance[1]. Hole-by-hole scores were also collected from both the men's and women's Pac-10 conference championships which allowed for the calculation of the following additional measures: Pac-10 tournament stroke average; the total number of birdies (one under par on a hole) or better; and total number of double-bogies (two over par on a hole) or worse.

Procedure

Men's and women's coaches in the Pacific-10 Athletic Conference were contacted during the fall of 1996 by phone asking if they were interested in having their team participate in the study. Men's and Women's coaches at all of the Pac-10 institutions

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[1] The reason for including stroke average as a measure of performance is obvious but the rationale for number of competitive rounds requires some additional explanation. College golf tournaments typically allow 5 players per school but most golf teams are larger than this. In the present study, the size of the average men's golf team was 11.7 while the size of the average women's golf team was 7.9. Because of this, players must typically compete for and earn spots on the team for any given tournament. The number of competitive rounds was included as a measure of performance because it is assumed that better players will tend to play more frequently. This measure does have some disadvantages. For instance, a poor player could earn a tournament spot on a poor team while a good player may fail to earn a spot on a highly

agreed to participate. During January and February of 1997, the author traveled to each of the university sites and personally administered the questionnaires. The questionnaire packet consisted of the consent form (Appendix A), the Trait Golf Self-Efficacy Scale, the ACSI-28, the SAS, and the short form of the Marlowe-Crowne. The athletes were personally assured that their questionnaire responses would be kept confidential and would not be shared with their coach. The teams varied in size from 6 to 15 individuals and it took them approximately 20 minutes to complete the questionnaires. While players were completing their questionnaires, coaches completed the ACSI Rating Form and Physical Skill Rating Forms.

In May 1997, one day prior to the start of the Pacific-10 championship tournaments for men and women, participants completed the State Golf Self-Efficacy Scale. At the conclusion of this tournament, athletes completed the Cognitive Interference Questionnaire for Golfers. At this time, coaches were asked to complete the ACSI Rating Form and the Physical Skills Rating Form for each of their team members again to allow for the examination of the reliability of these two instruments. End of season performance data was assimilated via the World Wide Web (Laesch, 1997).

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competitive team. Despite this drawback, it is argued that in general, better players will tend to play more often, regardless of the caliber of the team they are on.

CHAPTER 3: RESULTS

Relations between Predictor Measures

Sample sizes, means, and standard deviations for all variables are presented in Table 1. Though the majority of means were similar across gender, there was a significant difference in self-efficacy, with the men scoring significantly higher than the women on both measures (Trait Golf Self-Efficacy: $\underline{M} = 97.3$ for the men, $\underline{M} = 83.5$ for the women, $\underline{t} = 5.7$, $\underline{p} < .001$; State Golf Self-Efficacy: $\underline{M} = 107.7$ for the men, $\underline{M} = 91.4$ for the women, $\underline{t} = 4.9$, $\underline{p} < .001$). Also of interest are the high Marlowe-Crowne means ($\underline{M} = 6.9$ for the men, $\underline{M} = 7.7$ for the women). These means are noticeably higher than the mean of 5.7 originally obtained by Reynolds (1982) and the median score of 4 obtained by Smith and Smoll using the same instrument with high school athletes (Wiechman, Smith, & Smoll, 1999). These means appeared high enough to justify controlling for social desirability in subsequent analyses.

Table 2 provides information concerning the test-retest reliability[2] of the ACSI Rating Form and the Physical Skills Rating Form. Reliability correlations ranged from .50 (Coping with Adversity) to .79 (Total Coping Skills, Long Game, Total Physical Skills). The average reliability was .60 for the ACSI Rating Form subscales and .75 for the Physical Skills Rating Form subscales, suggesting that the later measure was more stable. The total scores from both measures had the same test-retest reliability correlation of .79.

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[2] The retest interval varied from 6-12 weeks for the women's coaches and 8-14 weeks for the men's coaches. These variations were due to 1.) the fact that it took the author approximately six weeks to administer the first round of questionnaires to all of the teams and 2.) the men's and women's conference championships were scheduled two weeks apart from one another.

Table 3 contains the correlations between the subscales of the ACSI-28 and the ACSI Rating Form measures. Though most of the correlations were significant, they tended to be low in magnitude. Some of the processes measured by the ACSI scales, such as the ability to control worry, are covert in nature and are not readily observable, which might account for these low correlations. For the men, of the seven subscales, only Coping with Adversity resulted in a non-significant player-coach correlation. The scale with the highest correlation was Peaking under Pressure ($r = .52$, $p < .01$), and the correlation of the Total Coping Skills score for the two measures was significant as well ($r = .49$, $p < .01$). For the women, five of the seven subscales generated significant player-coach correlations, the strongest being for Control of Worry ($r = .37$, $p < .01$) and Coachability ($r = .34$, $p < .01$). As with the men, the player-coach correlation for the Total Coping Skills Score was also significant ($r = .38$, $p < .01$).

These results are similar to those obtained by Smith and Christensen (1995) and suggest a relatively low degree of agreement between the two different measures of psychological skills. From a multitrait-multimethod approach (Campbell & Fiske, 1959) there is poor convergent validity. Discriminant validity was also poor, as higher player-coach correlations were obtained on several non-corresponding subscales (e.g., Concentration from the ACSI-28 and Peaking under Pressure from the ACSI Rating Form) than on corresponding subscales (Concentration from the ACSI-28 and Concentration from the ACSI Rating Form). This was the case with the Coping with Adversity, Coachability, Concentration, Goal-Setting and Mental Preparation, and Control of Worry subscales for the men and the Coping with Adversity, Goal Setting and Mental Preparation, Confidence and Achievement Motivation, and Peaking under Pressure subscales for the women. On the remaining subscales, correlations between the corresponding coach and player subscales were highest.

The correlations between the ACSI-28, the ACSI Rating Form, and the Total Physical Skills score from the Physical Skills Rating Form are presented in Table 4. As in the Smith and Christensen (1995) study, the ACSI-28 was relatively uncorrelated with the physical ability measure. None of the subscales were significantly correlated with physical ability for the women while three of the seven subscales and the Total Coping Skills score were significantly correlated with physical ability for the men. These correlations imply that these two measures are relatively independent from each other. ACSI Rating Form, however, was strongly correlated with the Total Physical Skills score. For both the men and women, all the subscales and the Total Coping Skills Score were significantly correlated with the coaches' rating of physical ability. The strongest correlations (.64 for the men and .69 for the women) occurred with the Total Coping Skills Score, which represent common variances of approximately 41% and 48% respectively between the psychological and physical skill measures. These correlations are dissimilar to the corresponding correlations from the Smith and Christensen (1995) study and suggest that the coaches' ratings of physical ability and psychological skill are somewhat confounded and not completely independent of one another.

The correlations of the coach-rated variables with stroke average and rounds played for men are presented in Table 5. Looking first at the zero-order correlations, it can be seen that many of the subscales of the ACSI Rating form were significantly correlated with these two measures of golf performance. Male golfers receiving higher ratings on the various psychological skills by their coaches tended to have lower stroke averages and to play more frequently than those receiving lower ratings. The Peaking under Pressure subscale yielded the strongest correlation with stroke average ($r = -.56$, $p < .01$) while the Concentration subscale was most strongly associated with the number of rounds completed ($r = .43$, $p < .01$). The bottom half of the table presents the correlations of the

physical talent measures with performance. Each of the three individual physical skill ratings and the total combined physical skill rating was significantly correlated with stroke average and rounds played. Though the correlations for the two measures were roughly similar, it appeared that the Physical Skills Rating Form did a slightly better job of predicting performance than the ACSI Rating Form.

Examination of the partial correlations in Table 5 reveals that the coach ratings of psychological skills were substantially less correlated with performance after controlling for the athlete's Total Physical Skills rating. While all but one subscale yielded significant zero-order correlations with stroke average, only the Peaking under Pressure and Confidence and Achievement Motivation subscales remained significant after partialing out the physical ability rating. Similarly, four of the subscales and the Total Score had significant zero-order correlations with rounds played, but only the Concentration and Confidence and Achievement Motivation subscales yielded significant partial correlations. Given the strong correlations noted between the ACSI Rating Form subscales and the physical skill measure noted in Table 3, the reduction in significant subscale-performance measure correlations is not surprising.

Table 6 presents the same results for women. The overall pattern for the zero-order correlations is very similar to the one observed with the men. For the stroke average performance measure, the differences consist of the significance of the Coachability subscale (previously not significant for the men) and the non-significance of the Coping with Adversity subscale (previously significant for the men). In addition, the correlations of the ACSI Rating Form subscales with stroke average tended to be larger for the women (average correlation for the men: $\underline{r} = .34$, average correlation for the women: $\underline{r} = .44$). For the rounds played performance measure, the previously significant Confidence subscale is no longer significant for the women while the Coping with Adversity and

Control of Worry subscales are now significant. Examination of the partial correlations controlling for physical ability reveals that three of the seven subscales (Concentration, Confidence, and Control of Worry) and the Total Score remain significantly correlated with performance while two subscales (Coachability and Peaking under Pressure) remain significantly correlated with rounds played. The fact that more ACSI Rating Form subscales remained significant after controlling for physical ability suggests that the coaches of the women's teams may have done a slightly better job at distinguishing between their psychological and physical skill ratings than the men's coaches did.

Table 7 contains the correlations between each of the self-report measures and the short form of the Marlowe-Crowne social desirability scale. As can be seen, most of the measures were significantly correlated with social desirability, but there were some exceptions worth noting. Despite the fact that all the other subscales (with the exception of Goal Setting and Mental Preparation for the men) and the Total Coping Skills Score were significantly associated with the Marlowe-Crowne, Peaking under Pressure was surprisingly uncorrelated with social desirability for both men and women ($r = .03$ for the men, $r = .07$ for the women). It appears that this particular subscale may be less vulnerable to the social desirability bias. A similar but less pronounced pattern emerged with the self-efficacy measures. Neither the trait nor state measures of self-efficacy were significantly correlated with the Marlowe-Crowne but these correlations were somewhat larger than the non-significant correlations noted with the Peaking under Pressure subscale from the ACSI-28. Finally, the Cognitive Interference Questionnaire for Golfers was not significantly correlated with social desirability for the women. However, all of the correlations for women on this measure approached significance and their non-significance may have been due to the relatively small subject size upon which this correlation was based ($n = 49$).

The correlations between the three primary psychological self-report measures are shown in Table 8. As can be seen, all of the measures were significantly correlated with one another for both men and women. The largest correlation for the women occurred between the ACSI-28 and the Trait Golf Self-Efficacy Measure ($r = .74$, $p < .001$) while the largest correlation for the men came between the SAS and the ACSI-28 ($r = -.71$, $p < .001$). When Marlowe-Crowne scores were partialed out, the correlations dropped slightly but remained essentially the same. For instance, the correlation between the ACSI-28 and the Trait Golf Self-Efficacy measure for the women dropped from .74 to .73 while for the men the correlation of -.71 between the SAS and the ACSI-28 dropped to -.69.

Table 9 and Table 10 provide the ASCI-28 and SAS mean subscale scores for individuals scoring in the upper and lower tertile on the Trait Golf Self-Efficacy scale. For the men, only the Coachability subscale of the ACSI-28 failed to produce a significant difference between the two groups. In each case (even for the non-significant result) individuals who had higher self-efficacy scores also had higher or stronger psychological coping skill ratings. Similar results with the CIQ for Golfers are presented in Table 11. For these analyses, the State Golf Self-Efficacy measure was used to create the groups. A clear gender difference emerged in these results; none of the CIQ for Golfers means was significantly different for the men but all three of them were for the women. Women with stronger ratings of self-efficacy reported lower positive, negative, and total cognitive interference. Table 12 presents the correlations between the positive and negative item subscales from the CIQ for Golfers and the Trait and State Golf Self-Efficacy measures. Inspection of the correlations was suggestive of a gender difference, with the correlations for the women tending to be larger and more significant than the

correlations observed for the men. All correlations were negative, indicating an inverse relation between self-efficacy and cognitive interference.

Table 13 contains the correlations between presumably related subscales from each of the primary psychological measures. The relatively large correlations between corresponding worry subscales on the ACSI-28 and the SAS appear noteworthy. While all correlations except one were significant at the $p < .01$ level, the common variance between the various subscales tended to be moderate. For instance, there was a 21% variance overlap between the Concentration subscale from the ACSI-28 and the Concentration Disruption subscale from the SAS for the men.

Finally, a statistically significant relation between confidence and self-efficacy was found. The Confidence subscale from the ACSI-28 was correlated with the Trait Golf Self-Efficacy scale at .40 ($p < .01$) for the men and .56 ($p < .01$) for the women. The association between these two psychological constructs was even stronger when self-efficacy was assessed with the State Golf Self-Efficacy scale. This measure yielded correlations of .59 ($p < .01$) for the men and a substantial .72 ($p < .01$) for the women.

Correlations between Predictor Measures and Golf Performance

One of the primary objectives of the present study was to examine the correlation of the various psychological measures with golf performance. Given the relatively high social desirability score means and the significant correlations between the self-report measures and the short form of the Marlowe-Crowne (see Table 7), partial correlations were calculated to statistically control for the effect of this variable. Additional partial correlations were calculated partialing out Marlowe-Crowne score and the Total Physical Skills rating in order to examine the importance of psychological factors after statistically

controlling for both social desirability and physical factors. The results of these analyses for the men are presented in Table 14.

Looking first at the zero-order correlations, it can be seen that several of the scales were significantly correlated with the two measures of performance. Three of the seven subscales from the ACSI-28 were significantly correlated with stroke average and six of the seven subscales were significantly correlated with rounds played. The negative correlations with stroke average for all but one of the ACSI-28 subscales indicated that lower stroke averages were generally associated with higher (or stronger) ratings of psychological skills. The positive correlations with the rounds played performance measure indicated that men with higher ratings of psychological skills tended to play more often. The Peaking under Pressure and Control of Worry subscales generated the strongest correlations for both stroke average and rounds played. The Total Coping Skills score was also significantly correlated with both stroke average ($r = .26$, $p < .05$) and rounds played ($r = .41$, $p < .01$). Looking at the additional self-report measures, Trait Golf Self-Efficacy and the Worry subscale of the SAS were significantly correlated with stroke average. Individuals with higher self-efficacy and lower worry scores as measured by the SAS tended to have better (or lower) stroke averages. The same two scales, along with the Somatic subscale and Total score of the SAS, yielded significant correlations with rounds played.

Examination of the partial correlations statistically controlling for social desirability revealed that all of the correlations of the self-report measures with stroke average were strengthened. Three scales with non-significant zero order correlations achieved significant partial correlations: the Concentration and Goal Setting subscales from the ACSI-28 and the Total score from the SAS. A rather different pattern emerged

for the other performance measure, rounds played. Controlling for social desirability seemed to have little or no effect on these measures of association.

The final set of partial correlations presented in Table 14 addresses the issue of the unique predictive utility of the self-report measures after controlling for social desirability and physical ability. The Control of Worry subscale and Total Coping Skills score from the ACSI-28, the Trait Golf Self-Efficacy scale, and the Worry subscale from the SAS continued to be significantly correlated with stroke average. Of these, Control of Worry yielded the strongest partial correlation ($r = -.31$, $p < .01$). With the exception of Trait Golf Self-Efficacy, all of these measures also yielded significant partial correlations with rounds played. In addition, the Coping with Adversity and Peaking under Pressure subscales from the ACSI-28 and the Somatic subscale and Total score from the SAS were also significantly correlated with rounds played after controlling for the impact of physical skill.

Table 15 presents the same correlations with performance for women. The zero-order correlations of the self-report measures with stroke average were generally similar to the results obtained for the men. Four of the seven ACSI-28 subscales and the Total Coping Skills score were significantly correlated with stroke average. As was found with the men, women with higher psychological skill ratings tended to have lower stroke averages. Trait Golf Self-Efficacy, the Worry subscale of the SAS, and the Total score from the SAS were also significantly correlated with this performance measure. Surprisingly, none of the self-report measures generated significant zero order correlations with rounds played.

As was observed with the men, partial correlations controlling for social desirability were generally larger than the corresponding zero-order correlations. All of

the scales producing significant zero-order correlations with stroke average also generated significant partial correlations with both social desirability and physical skill were statistically controlled. The Coachability and Concentration subscales from the ACSI-28 resulted in significant correlations as well when controlling for physical skill.

Pac-10 Tournament Analyses

Near the completion of the 1996-97 collegiate golf season, the Men's and Women's Pac-10 Championship Tournaments were held. Sixty men and 50 women earned spots on their respective teams to play in this important event. Discriminant function analyses were conducted to determine whether or not any of the measures collected in this study could successfully discriminate between those who participated and those who did not. The results of these analyses are summarized in Table 16. As can be seen for the men, all of the major psychological measures yielded significant discriminant functions. Men who played in the Pac-10 Tournament tended to have higher ratings of self-efficacy, higher ratings of psychological coping skills, and lower ratings of sport specific anxiety. They were also rated more highly on their psychological and physical skills by their coaches. Surprisingly, the picture was somewhat different for the women as none of the self-report measures was able to successfully distinguish between Pac-10 Tournament participants and non-participants. Both coach-rated variables however were able to significantly discriminate between these two groups for the women.

Table 17 contains the correlations between each of the self-report measures and the average score per round at the Pac-10 Tournament. Looking first at the zero-order correlations for the ACSI-28, the Concentration, Confidence and Achievement Motivation, and Goal Setting and Mental Preparation subscales, along with Total Coping Skills score all generated significant correlations for men. When social desirability was

partialed out, all of these subscales also resulted in significant correlations that were somewhat larger than the corresponding zero-order correlations. The largest of these was for the Confidence and Achievement Motivation subscale, which had substantial partial correlation with average score per round of -.51 ($p < .01$). When physical skills were partialed out, these same subscales continued to produce significant though somewhat smaller partial correlations.

The pattern of correlations for the women was somewhat different for these variables. As was the case with the men, the Confidence and Achievement Motivation subscale, the Goal Setting and Mental Preparation subscale, and the Total Coping Skills score all yielded significant zero-order and social desirability controlled correlations. Similar significant zero-order and social desirability controlled partial correlations were found for the Coping with Adversity and Peaking under Pressure subscales. However, only the Total Coping Skill score and Coping with Adversity subscale continued to be significantly correlated with average score per round after both social desirability and physical skills were partialed out.

For both the men and the women, self-efficacy was a consistently significant predictor of Pac-10 Tournament performance. The partial correlation controlling for social desirability and physical skill between Trait Golf Self-Efficacy and average score per round was the only one of the twelve self-efficacy correlations with performance that did not reach significance. Compared to the Trait Golf Self-Efficacy measure (which was collected mid-Winter), State Golf Self-Efficacy (assessed the day before the start of the Pac-10 Tournament) was consistently a better predictor of Pac-10 Tournament performance. The correlation between the trait and state measures of self-efficacy was .70 ($p < .01$) for the men and .84 ($p < .01$) for the women. It is worth noting the particularly strong partial correlation between State Golf Self-Efficacy and performance

for the women; the correlation of -.48 ($p < .01$) was among the highest observed in the study and indicated that, after controlling for physical skill and social desirability, a substantial 23% of the variation in stroke average was accounted for by self-efficacy.

In contrast, the SAS did less well in predicting golf performance. Only the Worry subscale of the SAS for the women was consistently correlated with average score across the zero-order and partial correlations. The Cognitive Interference Questionnaire for Golfers did a surprisingly good job of predicting performance. Both the Negative Items subscale and the Total Score were significantly correlated with performance across all zero-order and partial correlations. The Positive Items subscale was uncorrelated with performance. The correlations between the trait (SAS) and state (CIQ for Golfers) measures of cognitive interference were somewhat lower than similar correlations obtained for self-efficacy. The CIQ for Golfers was correlated .47 ($p < .05$) for both men and women with the Concentration Disruption subscale and was correlated .61 ($p < .01$) for men and .57 ($p < .05$) for women with the Worry subscale.

The correlations and partial correlations of the same self-report measures with the total number of birdies or better made at the Pac-10 tournament are presented in Table 18. Despite a few exceptions, the predictor measures weren't as strongly correlated with this particular measure of performance as they were with average score per round. For instance, only the Coping with Adversity subscale of the ACSI-28 was consistently correlated with total birdies across all three correlations for the women. For the men, several of the ACSI-28 subscales were significantly correlated with total birdies after controlling for social desirability but only the Goal Setting and Mental Preparation subscale continued to be a significant predictor after physical skills were also partialed out ($r = .26$, $p < .05$). Both measures of self-efficacy predicted total birdies relatively well for the women but only one of the possible six correlations proved significant for the

men. None of the subscales of the SAS resulted in significant correlations. The strongest predictor of this particular measure of performance was the Cognitive Interference Scale for Golfers. As can be seen in the table, after controlling for physical skills and social desirability, the Negative Items scale of the Cognitive Interference questionnaire was correlated -.35 ($p < .01$) with total birdies for the men and -.48 ($p < .01$) for the women.

Table 19 contains the correlations of the same self-report measures with the total number of double-bogeys (two over par on a given hole) or worse made in the Pac-10 tournament. For the men, the ACSI-28 appeared to do the best job of predicting this outcome. The Total Coping Skills score and the Concentration, Confidence and Achievement Motivation, and Coachability subscales resulted in significant partial correlations when controlling for social desirability and physical skills. The largest of these correlations occurred with the Confidence and Achievement Motivation subscale ($r = .44$, $p < .01$). Surprisingly, the ACSI-28 did not correlate strongly with total double-bogies or worse for the women. Only the Total Coping Skills Score yielded a significant partial correlation when Marlowe-Crowne scores were statistically controlled ($r = .28$, $p < .05$).

Interestingly, self-efficacy appeared to be the best predictor of double-bogeys for women. Both the trait and state forms of this measure were correlated with this measure of golf performance. Self-efficacy did not predict this outcome as well for the men. The SAS and the Cognitive Interference Questionnaire for Golfers were also relatively uncorrelated with total double bogies; only the Worry subscale on the SAS yielded significant correlations for the women.

Table 20 contains the correlations of the coach-rated measures with each of the three measures of performance at the Pac-10 Tournament for the men. Examination of

the zero-order correlations reveals that the ACSI Rating Form was generally well correlated with each measure of performance. Relative to the other ACSI Rating Form subscales, the Peaking under Pressure subscale appeared to be the best predictor of Pac-10 Tournament performance. It resulted in the strongest correlation with tournament stroke average ($r = -.48$, $p < .01$) and Total Birdies or Better ($r = .44$, $p < .01$), and the second strongest correlation with Total Double-Bogeys or Worse. In comparison, the zero-order correlations of the Physical Skills Rating Form with performance were generally stronger. All three of the subscales and the Total Physical Skills score were significantly correlated with each measure of golf performance and these correlations tended to be larger than the correlations yielded by the ACSI Rating Form.

When the Total Physical Skills score was partialed out of the zero-order correlations, the ACSI Rating Form was considerably less well correlated with golf performance. Only the Peaking under Pressure subscale continued to generate significant correlations with both tournament stroke average and Total Birdies or Better. All other correlations were non-significant.

The same set of correlations for women is presented in Table 21. The overall pattern of the results for the women was similar to those obtained for the men. The Physical Skills Rating Form resulted in correlations that were roughly equivalent to those obtained with the men and the zero-order correlations of the ACSI Rating Form were comparable as well. However, there were a few differences worth noting. First, it appeared that the zero-order correlations of the ACSI Rating Form with performance were somewhat higher for the women, particularly with the tournament stroke average measure. A second difference concerned the impact of partialing out physical talent. While the partial correlations for the women were significantly lower than the corresponding zero-order correlations (as was the case with the men), different subscales

remained significant at this second step in the analyses. The Peaking under Pressure subscale remained significant for the men but for the women, the Coachability subscale and to lesser extents, the Control of Worry subscale and Total Coping Skills score, remained significantly correlated with Pac-10 Tournament performance after physical ability had been statistically controlled.

Discriminant function analyses were performed to determine if any of the predictor variables could differentiate between golfers who did and did not make a double-bogey or worse during the final round of the Pac-10 Tournament. A summary of these analyses is presented in Table 22. As can be seen, none of the self-report measures resulted in significant discriminant functions for the men but both of the self-efficacy measures did so for the women. Of the two measures, the State Golf Self-Efficacy scale was the better discriminator; it yielded a Wilke's lambda of .86 ($p < .01$) and was able to correctly classify 71% of the group members. Of the two coach-rated measures, the Total Coping Skills score was the better discriminator, producing significant discriminant functions for both men and women. The discriminant function for ACSI Rating Form was significant only for the women.

Structural Modeling

Multiple-group structural equation modeling (Robinson, Abbott, Beringer, & Busse, 1996; Bentler, 1992) was used to assess the adequacy of the causal model shown in Figure 1 and to determine the consistency of this model between men and women college golfers. As can be seen, indicators of the Physical Ability factor were the coach's ratings of the player's long game, short game, and putting. The indicators of the Trait Psychological Factor were the ACSI-28, Trait Golf Self-Efficacy, and the SAS. The Golf

Performance Factor was measured by the Stroke Average and Rounds Played. Correlations among the 8 variables for men and women are shown in Table 23. To control for the effects of social desirability, Marlowe-Crowne scores were partialed out.

Figure 1 also contains the path estimates and z-scores from the structural modeling analyses. Except for the structural path between the psychological factor and the performance factor for women, all other factor loadings, correlations, and structural paths were statistically significant ($z > 1.96$). In the unconstrained multiple group model, where the factor loadings, correlations, and structural paths were freely estimated for men and women separately, the χ^2 ($df = 34$, $N = 147$) was 56.3 and the Comparative Fit Index (CFI) was .95. These results suggested a strong fit for this model to the data. Of particular importance was the significance of the direct path between the Trait Psychological Factor and the Golf Performance Factor for the men. Unfortunately, this same path was not statistically significant for the women.

To determine if the factor structures differed for men and women, a second multiple-group factor analysis was run with all factor loadings, correlations, and structural paths constrained to be equal for men and women. For this constrained model, the χ^2 ($df = 44$, $N = 147$) was 65.2 while the CFI was .95. The difference in the chi-square between the unconstrained and constrained analyses was 8.9 ($df = 10$, $N = 147$) which was not statistically significant. None of the constraints in the second analysis were significant when evaluated with the Lagrange Multiplier Test. These results suggest that the factor structures for Model 1 are roughly the same for men and women.

A similar model was tested using only those golfers who competed in the Pac-10 Championships. Compared to the previous model, Model 2 contains a State Psychological Factor (rather than a trait factor) measured by the State Golf Self-Efficacy

scale and the Cognitive Interference Questionnaire for Golfers and has only one indicator of performance (tournament stroke average). The correlations among the variables used in these analyses are shown in Table 24 while the structural model, path estimates, and z-scores are presented in Figure 2. The unconstrained model yielded a χ^2 (df = 14, N = 110) of 23.8 and the CFI was .94, which suggests that the model fits the data rather well. In contrast to the results obtained for Model 1, the model of the women yielded a significant structural path between the State Psychological Factor and Pac-10 Stroke Average; the same structural path for the men was not significant.

As was done with the first model, a constrained model was tested to evaluate the consistency of the current model across genders. For this constrained model, the χ^2 (df = 22, N = 110) was 31.0 while the CFI was .95. The difference in the chi-square between the constrained and unconstrained models was a non-significant 7.2 (df = 8, N = 110). As was the case with the previous Model 1, follow-up Lagrange Mutiplier Tests failed to yield any significant constraints.

To allow for a more direct comparison between the trait and state measures utilized in this study, a third model (see Figure 3) was tested where the State Psychological Factor from Model 2 was replaced with the Trait Psychological Factor from Model 1. Table 25 contains the social-desirability-controlled correlations used in this set of analyses. The test of the unconstrained model yielded a χ^2 (df = 24, N = 110) of 30.1 and a CFI of .98. All path estimates were statistically significant except for the structural path from the Trait Psychological Factor to Pac-10 Stroke Average for both men and women. The χ^2 (df = 33, N = 110) for the constrained model was 38.8, while the CFI remained at .98. The difference between the constrained and unconstrained χ^2 (df = 9, N = 110) was a non-significant 8.6, suggesting that the models for the men and women were once again

similar. However, unlike the analyses for Model 1 and Model 2, results from the Lagrange Multiplier Test indicated the presence a statistically significant difference ($p < .05$) between men (.55) and women (.84) on the Trait Golf Self-Efficacy factor loading. All other constraints tested were not significant.

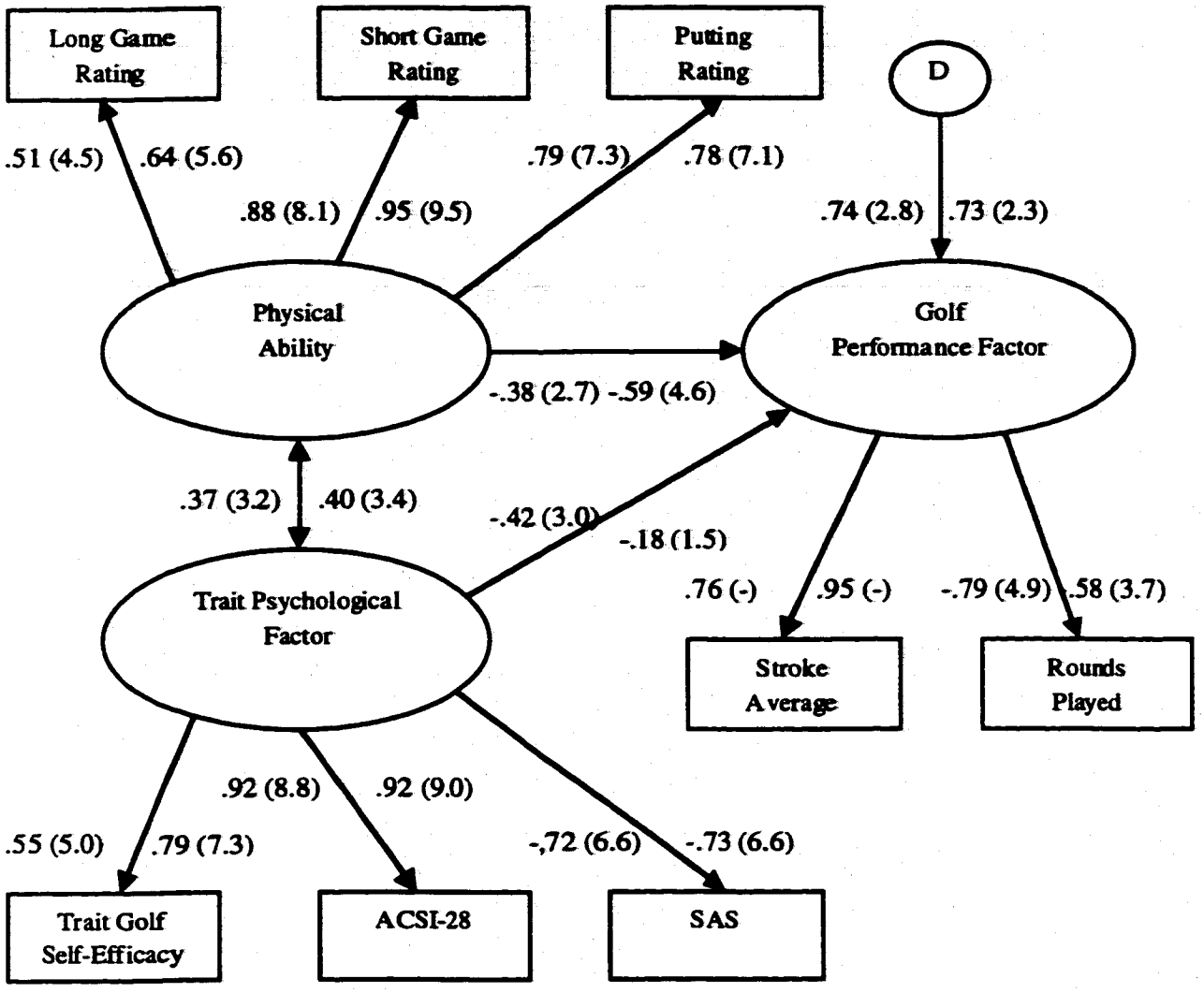

Figure 1. Model 1 Testing the Causal Relationship between the Trait Psychological Factor, Physical Ability, and Golf Performance.
NOTE: Figure includes path coefficients and z-scores (in parentheses). Coefficients for the men are on the left and coefficients for the women are on the right. Z-scores greater than or equal to 2.0 are significant at the .05 level. Path from Golf Performance to Stroke Average set to 1.0 for the model estimation purposes.

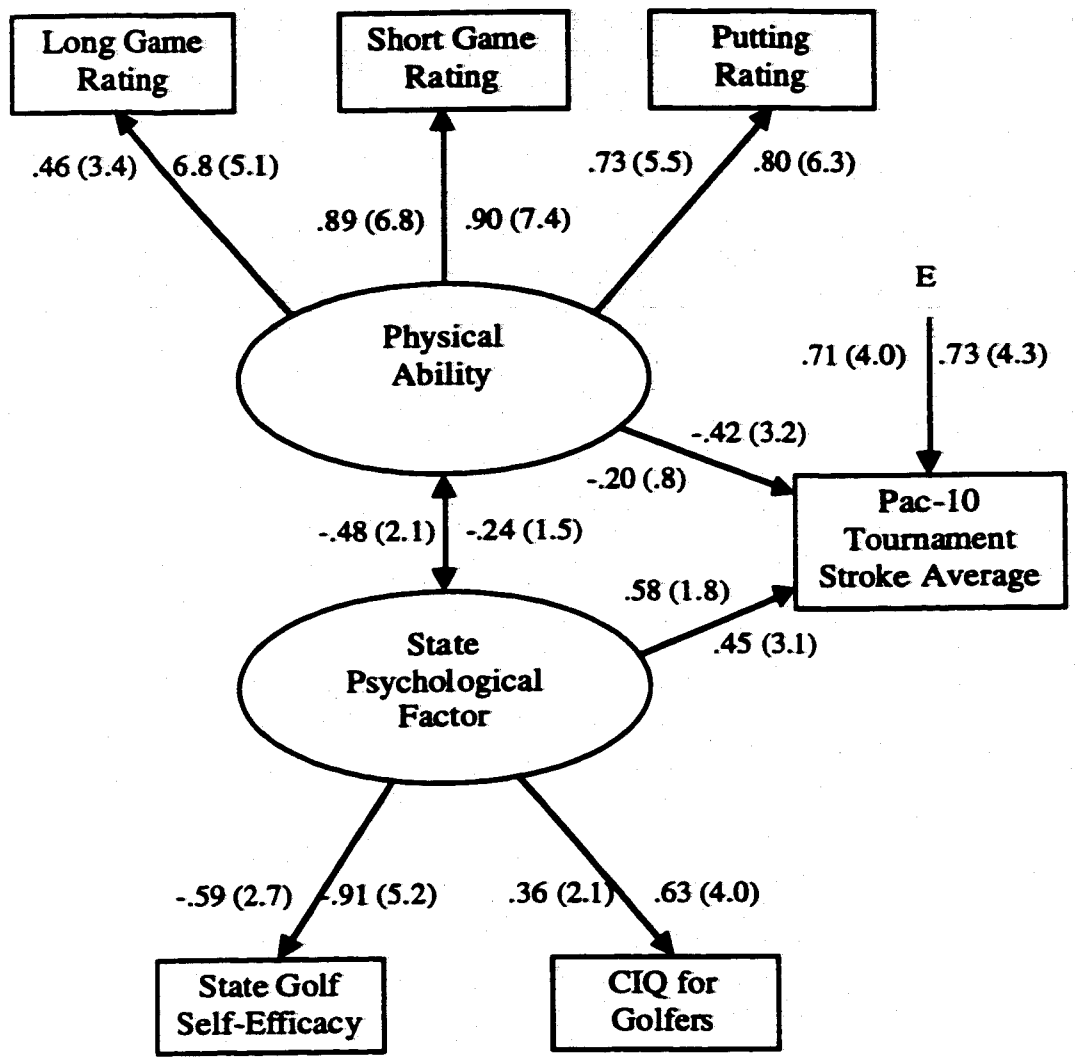

Figure 2. Model 2 Testing the Causal Relationship Between the State Psychological Factor, Physical Ability, and Pac-10 Tournament Stroke Average.
NOTE: Figure includes path coefficients and z-scores (in parentheses). Coefficients for the men are on the left and coefficients for the women are on the right. Z-scores greater than or equal to 2.0 are significant at the .05 level.

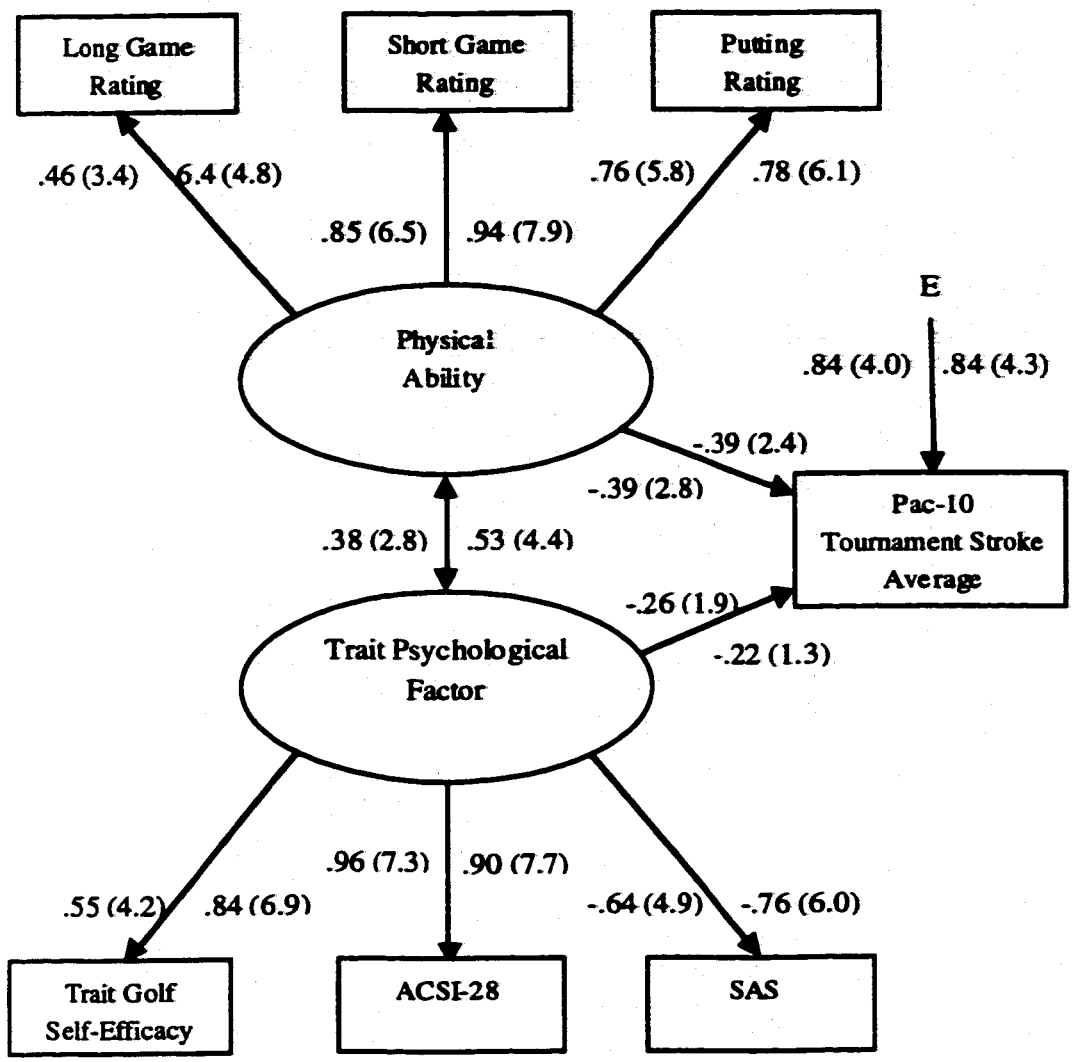

Figure 3. Model 3 Testing the Causal Relationship Between the Trait Psychological Factor, Physical Ability, and Pac-10 Tournament Stroke Average.
NOTE: Figure includes path coefficients and z-scores (in parentheses). Coefficients for the men are on the left and coefficients for the women are on the right. Z-scores greater than or equal to 2.0 are significant at the .05 level.

Table 1.
Sample Sizes, Means, and Standard Deviations of Variables for Men and Women

Measure	Men			Women		
	n	Mean	SD	n	Mean	SD
ACSI-28						
Coping with Adversity	111	7.19	2.19	78	6.95	2.67
Coachability	111	9.60	2.07	78	9.77	1.95
Concentration	111	7.73	2.32	78	7.67	2.11
Confidence	111	8.03	2.23	78	8.09	2.39
Goal Setting	111	5.84	2.67	78	6.40	2.89
Peaking under Pressure	111	8.12	2.70	78	7.55	3.15
Control of Worry	111	7.26	2.70	78	6.83	2.76
Total Coping Skills	111	53.77	11.77	78	53.26	12.05
ACSI Rating Form						
Coping with Adversity	114	3.28	.96	78	3.37	.88
Coachability	114	3.75	.78	79	3.96	1.03
Concentration	114	3.36	.89	78	3.46	.88
Confidence	114	3.49	.95	78	3.74	1.01
Goal Setting	114	3.23	1.02	78	3.56	.96
Peaking under Pressure	114	3.22	.93	79	3.39	.95
Control of Worry	114	3.18	.89	79	3.27	.90
Total Coping Skills	114	23.52	4.85	78	24.83	4.43
Self-Efficacy						
Trait	111	97.34	16.01	78	83.51	16.96
State	58	107.70	16.66	49	91.44	16.01
SAS						
Concentration Disruption	110	8.96	2.86	78	9.11	2.73
Somatic	111	17.22	5.31	78	17.81	5.31
Worry	110	14.80	4.56	78	16.18	5.50
Total	109	40.98	10.62	78	43.10	11.13
CIQ for Golfers						
Negative Items	58	29.79	11.21	49	29.30	9.94
Positive Items	58	15.83	4.90	49	16.22	4.80
Total	58	45.63	14.75	49	45.52	13.60
Marlowe-Crowne	110	6.92	2.74	78	7.70	2.73
Physical Skills						
Long Game	114	5.94	1.38	79	6.30	1.48
Short Game	114	5.89	1.50	79	6.23	1.46
Putting	114	5.80	1.38	79	6.01	1.49
Total	114	17.63	3.45	79	18.54	3.80
Performance Variables						
Overall Stroke Average	80	75.68	2.85	67	78.55	3.48
Rounds Played	80	10.70	5.01	67	8.82	3.12
Pac-10 Tournament						
Stroke Average	60	75.05	3.84	50	76.87	4.00
Total Birdies	60	10.27	3.80	50	5.92	3.24
Total Double-Bogeys	60	2.50	1.81	50	1.74	1.64

Table 2.
Six-Twelve Week Test-Retest Reliabilities for the ACSI Rating Form and The Physical Skills Rating Form

Measure	Correlation
ACSI Rating Form	
Coping with Adversity	.50**
Coachability	.54**
Concentration	.62**
Confidence	.61**
Goal Setting	.71**
Peaking under Pressure	.67**
Control of Worry	.58**
Total Coping Skills	.79**
Physical Skills Rating Form	
Long Game	.79**
Short Game	.75**
Putting	.77**
Total Physical Skills	.79**

* $p < .05$. ** $p < .01$.

Table 3.
Correlations of Corresponding Factors from the ACSI-28 and ACSI Rating Form

Measure	Men	Women
Coping with Adversity	.11	.19
Coachability	.27**	.34**
Concentration	.29**	.28*
Confidence	.45**	.27*
Goal Setting	.28**	.14
Peaking under Pressure	.52**	.30**
Control of Worry	.30**	.37**
Total Coping Skills	.49**	.38**

* $p < .05$. ** $p < .01$.

Table 4.
Correlations of ACSI-28 and ACSI Rating Form with the Physical Skills Rating Form Total Score

Measure	Men	Women
ACSI-28		
Coping with Adversity	.09	-.01
Coachability	.03	-.04
Concentration	.18	-.01
Confidence	.33**	.20
Goal Setting	.05	.10
Peaking under Pressure	.43**	.20
Control of Worry	.26**	.11
Total Coping Skills	.29**	.13
ACSI Rating Form		
Coping with Adversity	.45**	.36**
Coachability	.27**	.37**
Concentration	.61**	.50**
Confidence	.52**	.38**
Goal Setting	.43**	.55**
Peaking under Pressure	.64**	.59**
Control of Worry	.43**	.53**
Total Coping Skills	.64**	.69**

* $p < .05$. ** $p < .01$.

Table 5.
Correlations of Coach-Rated Measures with Stroke Average and Rounds Played for Men

Measure	Stroke Avg.		Rounds	
	Zero	P	Zero	P
ACSI Rating Form				
Coping with Adversity	-.19*	.01	.11	-.07
Coachability	-.13	-.01	.17	.07
Concentration	-.35**	-.07	.43**	.23*
Confidence	-.41**	-.21*	.38**	.20*
Goal Setting	-.36**	-.14	.34**	.15
Peaking under Pressure	-.56**	-.36**	.40**	.18
Control of Worry	-.26*	-.06	.14	-.04
Total Coping Skills	-.43**	-.17	.38**	.14
Physical Skills				
Long Game	-.55**	-	.51**	-
Short Game	-.35**	-	.31**	-
Putting	-.35**	-	.29**	-
Total	-.51**	-	.44**	-

* $p < .05$. ** $p < .01$.
Zero = Zero order correlation; P = Total Physical Skills Rating partialed out

Table 6.
Correlations of Coach-Rated Measures with Stroke Average and Rounds Played for Women

Measure	Stroke Avg.		Rounds	
	Zero	P	Zero	P
ACSI Rating Form				
Coping with Adversity	-.20	.02	.28*	.15
Coachability	-.36**	-.17	-.01	-.21*
Concentration	-.47**	-.24*	.36**	.18
Confidence	-.45**	-.29**	.18	.02
Goal Setting	-.43**	-.15	.33**	.12
Peaking under Pressure	-.46**	-.16	.43**	.25*
Control of Worry	-.55**	-.33**	.33**	.13
Total Coping Skills	-.61**	-.33**	.41**	.17
Physical Skills				
Long Game	-.56**	-	.41**	-
Short Game	-.58**	-	.41**	-
Putting	-.46**	-	.30**	-
Total	-.62**	-	.43**	-

* $p < .05$. ** $p < .01$.
Zero = Zero order correlation; P = Total Physical Skills Rating partialed out

Table 7.
Correlations of Self-Report Measures with Social Desirability

Measure	Men	Women
ACSI-28		
Coping with Adversity	.31**	.41**
Coachability	.32**	.33**
Concentration	.33**	.26**
Confidence	.24*	.26**
Goal Setting	.18	.37**
Peaking under Pressure	.03	.07
Control of Worry	.22*	.34**
Total Coping Skills	.33**	.43**
Self-Efficacy		
Trait	.13	.20
State	.23	.22
SAS		
Concentration Disruption	-.35**	-.34**
Somatic	-.26**	-.31**
Worry	-.27**	-.36**
Total	-.34**	-.41**
CIQ for Golfers		
Negative	-.38**	-.22
Positive	-.30*	-.27
Total	-.38**	-.26

* $p < .05$. ** $p < .01$.

Table 8.
Correlations between Trait Golf Self-Efficacy, ACSI-28, and SAS for Men (n = 111 Below Diagonal) and Women (n = 78 Above Diagonal)

Measure	Trait S.E.	ACSI-28	SAS
Trait S.E.	-	.74**	-.54**
ACSI-28	.54**	-	-.70**
SAS	-.38**	-.71**	-

* $p < .05$. ** $p < .01$.

Table 9.
Comparison of ACSI-28 and SAS Subscale Means (and Standard Deviations) for Men Scoring in the Upper and Lower Tertiles on the Trait Golf Self-Efficacy Scale

Measure	Lower Tertile	Upper Tertile	t	ES
ACSI-28				
Coping with Adversity	6.2 (2.2)	8.5 (2.1)	4.6**	1.0
Coachability	9.0 (2.4)	9.8 (2.1)	1.7	0.4
Concentration	6.6 (2.5)	9.0 (2.1)	4.8**	1.1
Confidence	6.7 (2.1)	9.6 (1.8)	6.3**	1.5
Goal Setting	5.0 (3.0)	7.1 (2.0)	3.7**	0.8
Peaking under Pressure	7.4 (2.5)	9.2 (2.8)	2.8**	0.7
Control of Worry	6.2 (2.7)	8.3 (2.3)	3.6**	0.8
Total Coping Skills Score	47.2 (10.3)	61.6 (9.8)	6.2**	1.4

* $p < .05$. ** $p < .01$.
ES = Effect Size = $(M_1 - M_2)/(MSE)^{1/2}$

Table 10.
Comparison of ACSI-28 and SAS Subscale Means (and Standard Deviations) for Women Scoring in the Upper and Lower Tertiles on the Trait Golf Self-Efficacy Scale

Measure	Lower Tertile	Upper Tertile	t	ES
ACSI-28				
Coping with Adversity	5.9 (2.3)	7.8 (2.7)	2.9**	0.7
Coachability	8.9 (1.6)	10.4 (2.2)	2.9**	0.8
Concentration	6.6 (2.0)	8.8 (1.8)	4.1**	1.1
Confidence	6.3 (2.2)	10.1 (1.5)	7.2**	2.1
Goal Setting	5.1 (2.8)	7.9 (2.6)	3.7**	1.0
Peaking under Pressure	5.6 (3.0)	9.8 (2.2)	5.8*	1.5
Control of Worry	5.4 (2.8)	8.1 (2.5)	3.6**	1.1
Total Coping Skills Score	43.8 (10.0)	62.8 (8.3)	7.5**	2.1

* $p < .05$. ** $p < .01$.
ES = Effect Size = $(M_1 - M_2)/(MSE)^{1/2}$

Table 11.
Comparison of CIQ for Golfers Subscale Means (and Standard Deviations) for Men and Women Scoring in the Upper and Lower Tertiles on the State Golf Self-Efficacy Scale

Measure	Lower Tertile	Upper Tertile	t	ES
	Men			
CIQ for Golfers				
Negative Items	30.7 (11.8)	26.9 (8.1)	1.1	0.4
Positive Items	16.0 (4.6)	14.9 (4.8)	.6	0.2
Total	46.7 (14.3)	41.8 (12.2)	1.1	0.3
	Women			
CIQ for Golfers				
Negative Items	37.9 (9.8)	22.6 (5.9)	5.4**	1.9
Positive Items	18.7 (5.7)	14.9 (3.9)	2.2*	0.8
Total	56.6 (14.5)	37.5 (9.0)	4.5**	1.7

* $p < .05$. ** $p < .01$.
ES = Effect Size = $(M_1 - M_2)/(MSE)^{1/2}$

Table 12.
Correlations of CIQ for Golfers Subscales with Trait and State Golf Self-Efficacy

	Men		Women	
Measure	**Trait**	**State**	**Trait**	**State**
CIQ for Golfers				
Negative Items	-.20	-.29*	-.59**	-.67**
Positive Items	-.29*	-.19	-.34**	-.31*

* $p < .05$. ** $p < .01$.

Table 13.
Correlations between Related ACSI-28, SAS, and CIQ for Golfers Subscales for Men (n = 111 for ACSI-28 and SAS, n = 58 for CIQ for golfers, Below Diagonal) and Women (n = 78 for ACSI-28 and SAS, n = 49 for CIQ for Golfers, Above Diagonal)

	ACSI-28		SAS		CIQ	
	Concen	Worry	Con Dis	Worry	Negative	Total
ACSI-28						
Concen	-	.48**	-.41**	-.48**	-.57**	-.54**
Worry	.32**	-	-.42**	-.82**	-.49**	-.52**
SAS						
Con Dis	-.46**	-.24*	-	.47**	.41**	.47**
Worry	-.46**	-.76**	.49**	-	.58**	.57**
CIQ						
Negative	-.49**	-.53**	.50**	.60**	-	.96**
Total	-.48**	-.53**	.47**	.61**	.96**	-

* $p < .05$. ** $p < .01$.
Concen = Concentration; Worry (ACSI-28) = Control of Worry; Con Dis = Concentration Disruption; Negative = CIQ for Golfers Negative Items Score; Total = CIQ for Golfers Total Score.

Table 14.
Correlations of Self-Report Measures with Stroke Average and Rounds Played for Men

Measure	Stroke Average			Rounds Played		
	Zero	MC	MC,P	Zero	MC	MC,P
ACSI-28						
Coping with Adversity	-.01	-.10	-.12	.22*	.21*	.24*
Coachability	.02	-.06	-.08	.13	.11	.14
Concentration	-.16	-.24*	-.16	.23*	.22*	.14
Confidence	-.23*	-.32**	-.18	.27**	.26*	.11
Goal Setting	-.16	-.23*	-.13	.26*	.25*	.17
Peaking under Pressure	-.30**	-.34**	-.14	.38**	.38**	.20*
Control of Worry	-.32**	-.40**	-.31**	.39**	.39**	.29**
Total Coping Skills	-.26*	-.38**	-.26*	.41**	.41**	.30**
Self-Efficacy						
Trait	-.25*	-.31**	-.21*	.20*	.19*	.08
SAS						
Concentration Disruption	.10	.18	.13	-.16	-.15	-.10
Somatic	.07	.14	.07	-.36**	-.36**	-.33**
Worry	.33**	.43**	.29**	-.41**	-.42**	-.28**
Total	.20*	.30**	.19	-.42**	-.42**	-.34**
Marlowe-Crowne	.21*			.06		

* $p < .05$. ** $p < .01$.
Zero = Zero order correlation; MC = Marlowe-Crowne partialed out; MC, P = Marlowe-Crowne and Total Physical Skills score partialed out

Table 15.
Correlations of Self-Report Measures with Stroke Average and Rounds Played for Women

Measure	Stroke Average			Rounds Played		
	Zero	MC	MC,P	Zero	MC	MC,P
ACSI-28						
Coping with Adversity	-.15	-.19	-.16	-.04	-.04	-.10
Coachability	.14	.12	.22*	-.09	-.10	-.15
Concentration	-.17	-.20	-.21*	.02	.02	.00
Confidence	-.34**	-.37**	-.24*	.14	.15	.02
Goal Setting	-.29**	-.34**	-.22*	.06	.07	-.07
Peaking under Pressure	-.34**	-.35**	-.24*	.07	.07	-.06
Control of Worry	-.22*	-.25*	-.21*	.07	.08	.01
Total Coping Skills	-.31**	-.38**	-.26*	.06	.06	-.08
Self-Efficacy						
Trait	-.30**	-.32**	-.26*	-.07	-.07	-.18
SAS						
Concentration Disruption	.10	.13	.07	-.15	-.16	-.12
Somatic	.09	.10	.03	.02	.02	.08
Worry	.36**	.40**	.29**	-.19	-.20	-.08
Total	.24*	.28*	.18	-.12	-.13	-.03
Marlowe-Crowne	.06	-	-	.00	-	-

* $p < .05$. ** $p < .01$.
Zero = Zero order correlation; MC = Marlowe-Crowne partialed out; MC, P = Marlowe-Crowne and Total Physical Skills Rating partialed out

Table 16.
Summary of Discriminant Function Analyses Predicting Pac-10 Tournament Participation

	Men			Women		
Measure	**λ**	**Sig.**	**%**	**λ**	**Sig.**	**%**
Self-Report Measures						
Trait Golf Self-Efficacy	.95	p<.05	55%	1.00	n.s.	53%
ACSI-28	.88	p<.001	67%	.99	n.s.	54%
SAS	.91	p<.01	63%	.99	n.s.	61%
Coach-Rated Measures						
ACSI Rating Form	.83	p<.001	70%	.82	p<.001	72%
Total Physical Skills	.81	p<.001	67%	.83	p<.001	71%

λ = Wilk's Lambda; Sig. = Significance; % = Percentage of people correctly classified; Men: 60 Pac 10 Participants, 54 Non-Participants; Women: 50 Pac-10 Participants, 28 Non-Participants

Table 17.
Correlations of Self-Report Measures with Average Score per Round at the Pac-10 Tournament

Measure	Men			Women		
	Zero	MC	MC,P	Zero	MC	MC,P
ACSI-28						
Coping with Adversity	.02	-.05	-.05	-.28*	-.31*	-.28*
Coachability	.06	.01	-.09	.05	.04	.15
Concentration	-.31*	-.39**	-.27*	-.17	-.18	-.13
Confidence	-.40**	-.51**	-.38**	-.30*	-.33**	-.18
Goal Setting	-.35**	-.42**	-.30*	-.25*	-.30*	-.17
Peaking under Pressure	-.21	-.26*	-.07	-.29*	-.30*	-.07
Control of Worry	-.09	-.16	-.12	-.17	-.20	-.16
Total Coping Skills	-.28*	-.41**	.29*	-.31*	-.36**	-.20
Self-Efficacy						
State	-.35**	-.40**	-.30*	-.48**	-.50**	-.48**
Trait	-.23*	-.27*	-.10	-.40**	-.43**	-.31**
SAS						
Concentration Disruption	.14	.23*	.18	-.03	-.01	-.06
Somatic	-.03	.03	.02	.14	.16	.04
Worry	.18	.30*	.18	.33**	.36**	.25*
Total	.10	.21	.14	.22	.25*	.13
Cognitive Interference						
Negative	.34**	.44**	.44**	.41**	.43**	.48**
Positive	.01	.06	.03	.07	.09	.14
Total	.26*	.36**	.34**	.33*	.35**	.40**

* $p < .05$. ** $p < .01$.
Zero = Zero order correlation; MC = Marlowe-Crowne partialed out; MC, P = Marlowe-Crowne and Total Physical Skills Rating partialed out

Table 18.
Correlations of Self-Report Measures with Total Number of Birdies or Better at the Pac-10 Tournament

Measure	Men			Women		
	Zero	MC	MC,P	Zero	MC	MC,P
ACSI-28						
Coping with Adversity	-.12	-.05	-.05	.31*	.36**	.34**
Coachability	-.14	-.08	-.01	-.10	-.07	-.13
Concentration	.21	.30*	.19	.09	.11	.07
Confidence	.23*	.34**	.19	.19	.23	.13
Goal Setting	.29*	.37**	.26*	.05	.10	.01
Peaking under Pressure	.17	.22*	.07	.11	.13	-.01
Control of Worry	.10	.18	.15	.03	.07	.03
Total Coping Skills	.16	.31*	.19	.15	.21	.11
Self-Efficacy						
State	.20	.26*	.15	.38**	.41**	.38**
Trait	.09	.13	-.03	.23*	.27*	.18
SAS						
Concentration Disruption	.01	-.08	-.02	.05	.03	.05
Somatic	.11	.04	.06	-.06	-.08	-.01
Worry	-.09	-.21	-.10	-.17	-.21	-.13
Total	.01	-.10	-.03	-.10	-.14	-.05
Cognitive Interference						
Negative	-.26*	-.37**	-.35**	-.43**	-.47**	-.48**
Positive	.05	-.01	.01	-.16	-.20	.22
Total	-.18	-.29*	-.26*	-.37**	-.41**	-.43**

* $p < .05$. ** $p < .01$.
Zero = Zero order correlation; MC = Marlowe-Crowne partialed out; MC, P = Marlowe-Crowne and Total Physical Skills Rating partialed out

Table 19.
Correlations of Self-Report Measures with Total Number of Double-Bogies or Worse at the Pac-10 Tournament

Measure	Men			Women		
	Zero	MC	MC,P	Zero	MC	MC,P
ACSI-28						
Coping with Adversity	-.10	-.15	-.17	-.18	-.21	-.17
Coachability	-.11	-.15	-.26*	-.09	-.11	-.05
Concentration	-.36**	-.41**	-.30*	-.09	-.10	-.05
Confidence	-.47**	-.55**	-.44**	-.20	-.23	-.09
Goal Setting	-.26*	-.30*	-.16	-.17	-.22	-.10
Peaking under Pressure	-.13	-.16	.04	-.18	-.19	.01
Control of Worry	.00	-.03	.02	-.17	-.20	-.16
Total Coping Skills	-.30*	-.39**	-.27*	-.23	-.28*	-.13
Self-Efficacy						
State	-.23*	-.26*	-.13	-.32*	-.34**	-.30*
Trait	-.20	-.22	-.05	-.27*	-.30*	-.17
SAS						
Concentration Disruption	.15	.20	.15	-.06	-.05	-.09
Somatic	-.07	-.04	-.06	.13	.15	.05
Worry	.14	.21	.08	.26*	.30*	.20
Total	.07	.13	.05	.18	.21	-.10
Cognitive Interference						
Negative	.13	.17	.13	.18	.20	.20
Positive	-.07	-.05	-.09	-.05	-.04	-.01
Total	.07	.12	-.07	.11	.13	.14

* $p < .05$. ** $p < .01$.
Zero = Zero order correlation; MC = Marlowe-Crowne partialed out; MC, P = Marlowe-Crowne and Total Physical Skills Rating partialed out

Table 20.
Correlations of Coach-Rated Measures with Average Score per Round, Total Birdies, and Total Double-Bogies or Worse at the PAC-10 Tournament for Men

	Score/Round		Total Birdies		Total Doubles	
Measure	**Zero**	**P**	**Zero**	**P**	**Zero**	**P**
ACSI Rating Form						
Coping with Adversity	-.14	.04	.05	-.12	-.18	-.02
Coachability	-.10	.02	.09	-.01	-.11	.00
Concentration	-.25*	.00	.10	-.16	-.27*	-.04
Confidence	-.33**	-.12	.26*	.07	-.27*	-.07
Goal Setting	-.31**	-.12	.23*	.06	-.28*	-.10
Peaking under Pressure	-.48**	-.30*	.44**	.27*	-.30**	-.07
Control of Worry	-.17	.06	.01	-.21	-.31**	-.14
Total Coping Skills	-.34**	-.08	.22*	-.03	-.33**	-.09
Physical Skills						
Long Game	-.45**	-	.39**	-	-.38**	-
Short Game	-.41**	-	.37**	-	-.39**	-
Putting	-.34**	-	.29*	-	-.34**	-
Total	-.50**	-	.43**	-	-.46**	-

* $p < .05$. ** $p < .01$.
Zero = Zero order correlation; P = Total Physical Skills Rating partialed out

Table 21.
Correlations of Coach-Rated Measures with Average Score per Round, Total Birdies, and Total Double-Bogies or Worse at the PAC-10 Tournament for Women

Measure	Score/Round		Total Birdies		Total Doubles	
	Zero	P	Zero	P	Zero	P
ACSI Rating Form						
Coping with Adversity	-.14	.00	.12	.03	-.22	-.12
Coachability	-.48**	-.31*	.29*	.17	-.42**	-.27*
Concentration	-.33**	-.16	.25*	.14	-.15	.02
Confidence	-.37**	-.26*	.22	.14	-.20	-.07
Goal Setting	-.39**	-.16	.28*	.15	-.14	.11
Peaking under Pressure	-.33**	-.07	.30*	.16	-.33*	-.11
Control of Worry	-.47**	-.28*	.40**	.29*	-.41**	-.25*
Total Score	-.52**	-.29*	.39**	.25*	-.36**	-.13
Physical Skills						
Long Game	-.48**	-	.31*	-	-.47**	-
Short Game	-.45**	-	.25	-	-.35*	-
Putting	-.39**	-	.25	-	-.31*	-
Total	-.51**	-	.31*	-	-.43**	-

* $p < .05$. ** $p < .01$.
Zero = Zero order correlation; P = Total Physical Skills Rating partialed out

Table 22.
Summary of Discriminant Function Analyses for Predicting Whether or Not Pac-10 Tournament Participants Made a Double-Bogey or Worse during the Last Round

	Men			Women		
Measure	**λ**	**Sig.**	**%**	**λ**	**Sig.**	**%**
Self-Report Measures						
Trait Golf Self-Efficacy	.98	n.s	57%	.91	$p < .05$	62%
State Golf Self-Efficacy	.96	n.s.	55%	.86	$p < .01$	71%
ACSI-28	.95	n.s.	64%	.96	n.s.	64%
SAS	.99	n.s.	42%	.96	n.s.	58%
CIQ for Golfers	.99	n.s.	51%	.96	n.s.	51%
Coach Rated Measures						
ACSI Rating Form	.99	n.s.	53%	.83	$p < .01$	67%
Total Physical Skills	.88	$p < .01$	70%	.90	$p < .05$	62%

λ = Wilke's lambda; Sig. = Significance; % = Percentage of people correctly classified. Men: 21 Had no Double-Bogies, 39 Had at Least One Double-Bogie or Worse; Women: 19 Had No Double-Bogies, 31 Had at Least One Double-Bogie or Worse

Table 23.
Model 1 Correlations (with Marlowe-Crowne Score Partialed Out) Among Measures and Standard Deviations for Men (n = 80 Below Diagonal) and Women (n = 67 Above Diagonal)

Var.	V1	V2	V3	V4	V5	V6	V7	V8	SD
V1	-	.6111	.4652	.1157	.1040	-.1003	-.5668	.4265	1.48
V2	.4398	-	.7474	.3900	.2456	-.3318	-.5740	.4112	1.50
V3	.3164	.7110	-	.2465	.1497	-.1661	-.4620	.3025	1.50
V4	.3368	.2500	.2779	-	.7324	-.6715	-.3802	.0622	12.06
V5	.2635	.1748	.2135	.5208	-	-.5937	-.3215	-.0726	16.98
V6	-.2580	-.2351	-.2222	-.6623	-.3526	-	.2836	-.1264	10.66
V7	-.5348	-.3303	-.3182	-.3754	-.3012	.2997	-	-.5467	3.48
V8	.5223	.3174	.2989	.4135	.1944	-.4110	-.5997	-	3.12
SD	1.32	1.46	1.40	10.82	14.74	10.75	2.85	5.01	

V1 = Long Game Rating; V2 = Short Game Rating; V3 = Putting Rating; V4 = ACSI-28; V5 = Trait Golf Self-Efficacy; V6 = SAS; V7 = Stroke Average; V8 = Rounds Played; SD = Standard Deviation

Table 24.
Model 2 Correlations (with Marlowe-Crowne Score Partialed Out) Among Measures and Standard Deviations for Men (n = 60 Below Diagonal) and Women (n = 50 Above Diagonal) Who Participated in the Pac-10 Tournament

Var.	V1	V2	V3	V4	V5	V6	SD
V1	-	.6051	.1985	.0510	.1573	-.5068	1.42
V2	.4019	-	.7384	.2640	-.0823	-.4497	1.45
V3	.2673	.6557	-	.1496	-.0913	-.3957	1.48
V4	.2290	.2688	.2168	-	-.5727	-.5004	1.58
V5	.0049	-.1125	-.0726	-.2100	-	.3355	1.35
V6	-.4334	-.4033	-.3354	-.3888	.2586	-	.32
SD	1.14	1.42	1.34	1.64	1.38	.27	

V1 = Long Game Rating; V2 = Short Game Rating; V3 = Putting Rating; V4 State Golf Self-Efficacy; V5 = CIQ for Golfers; V6 = Pac-10 Tournament Stroke Average; SD = Standard Deviation

Table 25.
Model 3 Correlations (with Marlowe-Crowne Score Partialed Out) Among Measures and Standard Deviations for Men (n = 60 Below Diagonal) and Women (n = 50 Above Diagonal) Who Participated in the Pac-10 Tournament

Var.	V1	V2	V3	V4	V5	V6	V7	SD
V1	-	.6051	.4985	.1592	.0976	-.0860	-.5068	1.4223
V2	.3952	-	.7384	.4168	.4981	-.3606	-.4497	1.4535
V3	.2660	.6561	-	.3477	.3997	-.2709	-.3957	1.4792
V4	.2494	.3192	.3443	-	.7525	-.6440	-.4323	1.8109
V5	.2463	.2282	.3593	.5238	-	-.6931	-.3601	1.2801
V6	-.1039	-.1415	-.1799	-.3393	-.6132	-	. 2514	1.1100
V7	-.4273	-.3981	-.3344	-.2618	-.3935	.1999	-	.3192
SD	1.1413	1.4258	1.3415	1.4380	.9822	.9790	.2689	

V1 = Long Game Rating; V2 = Short Game Rating; V3 = Putting Rating; V4 = Trait Golf Self-Efficacy; V5 = ACSI-28; V6 = SAS; V7 = Pac-10 Tournament Stroke Average; SD = Standard Deviation

CHAPTER 4: DISCUSSION

The present study investigated the importance of four psychological constructs for success in intercollegiate golf: self-efficacy, cognitive interference, sport anxiety, and athletic coping skills. A strength of the study was that it allowed for the examination of two questions typically not addressed in previous research: 1.) how important are these mental factors after physical ability has statistically been taken into account and 2.) to what extent is social desirability masking significant relationships between psychological factors and athletic performance? The study also explored the relations between each of the psychological constructs and permitted a direct comparison of how well each construct was correlated with golf performance.

A theoretical question advanced earlier speculated on whether athletes with high self-efficacy are more susceptible to cognitive interference from positive thoughts, such as images of doing well or succeeding. The results from the present study suggest that this is not the case. Though the differences were only statistically significant for the women, male and female golfers with higher self-efficacy reported fewer negative and positive distractions as measured by the CIQ for Golfers. In addition, the correlations between the Positive Items score from the CIQ for Golfers and both of the self-efficacy scales were negative, indicating an inverse relation between these two constructs. This correlation needed to be positive to provide support for this hypothesis. Thus, it appears that efficacious golfers experience less total cognitive interference and do not appear to be negatively impacted by intrusive positive thoughts.

Another interesting theoretical question addressed the hypothetical relation between self-efficacy and psychological coping skills. Assuming that these constructs are

associated in some way, there are at least two potential relations. Individuals with strong self-efficacy may use particular mental skills, such as goal setting or imagery, more often than athletes with lower feelings of efficacy. Alternatively, it could be that athletes with high self-efficacy use the same coping skills as athletes with weaker self-efficacy but simply use them more frequently. The results from this study suggest the latter hypothesis. Men and women scoring in the upper third on Trait Golf Self-Efficacy scale had consistently higher ACSI-28 subscale scores and only one these differences failed to achieve statistical significance. Thus, athletes with high self-efficacy do not appear to rely on a few specific mental skills to the exclusion of others but instead appear to draw equally on a wide variety of different skills.

A final noteworthy relation was observed between confidence and self-efficacy. There were significant correlations between the Confidence subscale from the ACSI-28 and both measures of self-efficacy. These correlations were strongest with the State Golf Self-Efficacy scale and tended to be larger for the women. It is unclear as to the cause of both of these patterns. Though significant, these correlations do not imply that the Confidence subscale could be substituted for self-efficacy but the large correlation of .72 observed with the women suggests that there is potentially a sizable amount of variance overlap between these two variables. Additional research is needed to further clarify the exact nature of this relation.

Each of the primary psychological constructs assessed in this study was an important correlate of golf performance for both male and female intercollegiate golfers. The Trait Golf Self-Efficacy measure was significantly correlated with the overall stroke average for both men and women. At the Pac-10 Championships, both the state and trait measures of self-efficacy were significantly correlated with tournament stroke average. Relative to one another, the state measure was consistently more strongly correlated with

performance than the trait measure. This finding is seemingly consistent with self-efficacy theory, which emphasizes the specificity of the construct as well as the importance of temporal proximity of efficacy assessments to the performance situation.

The State Golf Self-Efficacy scale did a particularly good job of predicting the performance of the women at the Pac-10 Championship. This measure yielded a partial correlation of .50 with tournament stroke average, after controlling for physical ability and social desirability, indicating that 25% of the variation of performance in this tournament was accounted for by self-efficacy. In addition, State Golf Self-Efficacy was also significantly correlated with the total number of birdies and total number of double-bogeys or worse. To summarize, women at the Pac-10 championship who had higher State Golf Self-Efficacy scores tended to shoot lower golf scores, to make more birdies, and to have fewer bad holes.

The Trait Golf Self-Efficacy measure was also able to distinguish significantly between male participants and non-participants at the Pac-10 Tournament. The men who earned spots on their school's Pac-10 Tournament team tended to have higher Trait Golf Self-Efficacy scores than those who remained behind. The measure was unable to make a similar significant distinction for the women and it is unclear as to why this is the case. These two discriminant analyses may be somewhat less meaningful due to the fact that a poor player could more easily earn a Pac-10 Tournament spot on a poor team while a better player may fail to earn a spot on a better team. Despite this potential limitation, it is argued that in general, the better players were still more likely to earn spots at the Pac-10 Championship.

In terms of the discriminant functions tested at the Pac-10 Tournament, both the trait and state self-efficacy measures were able to distinguish between women who did

and did not make a double-bogey or worse on the last day of the tournament. Thus, women with lower self-efficacy scores were more likely to have at least one bad hole during the presumably more intense final round. These results suggest that for the women, self-efficacy may achieve some of its positive effect on performance by improving consistency. These measures were unable to make a similar discrimination for the men.

The results concerning the importance of cognitive interference were more ambiguous and differed depending on how the construct was measured. Correlations between the various cognitive interference subscales utilized in this study were all statistically significant and in some cases were quite high. Correlations of .76 (men) and .82 (women) were obtained the corresponding worry subscales from the ACSI-28 and the SAS, while the average magnitude of correlations between related subscales from different measures was .51 for men and .53 for women. Despite the common variance, each of the cognitive interference measures correlated differentially with golf performance. Of the two subscales from the SAS that were thought to measure cognitive interference, only the Worry subscale was correlated with performance; the Concentration Disruption subscale was consistently uncorrelated with the majority of the performance measures. After controlling for physical ability and social desirability, the SAS Worry subscale yielded significant partial correlations with overall stroke average and rounds played for men and with overall stroke average and Pac-10 Tournament stroke average for women.

The CIQ for Golfers, administered at the conclusion of the Pac-10 Championships, was a surprisingly strong correlate of golf performance. Unlike the other measures in this study, the CIQ for Golfers was given after the conclusion of the Pac-10 Tournament. However, the correlation of the CIQ for Golfers with the social desirability revealed that

is was susceptible to the same bias as the other instruments. The overall measure, and in particular, the Negative Items subscale, were highly correlated with Pac-10 tournament stroke average for both women and men, even after physical skills and social desirability had been partialed out. In addition, the measure was significantly correlated with total birdies made during the tournament for both men and women. However, the measure was not significantly correlated with total double-bogeys or worse and did not discriminate between those who did and who did not make a double-bogey or worse during the last round.

In general, the CIQ for Golfers was a stronger correlate of performance than the Concentration Disruption and Worry subscales of the SAS. This difference may have been due to the fact that the CIQ for Golfers was created specifically to assess cognitive interference while the SAS was designed to assess sport anxiety. The positive results of the CIQ for Golfers may also be related to the fact that it was sport-specific in nature, unlike the SAS, which was generic in the sense that it was not related to any particular sport. Given the lack of such sport-specific measures and the success of the CIQ for Golfers demonstrated in the present study, it would seem that future research on sport-specific cognitive interference scales could be fruitful.

Finally, the ACSI-28 was also shown to be an important correlate of successful golf performance. The Total Coping Skills score from the ACSI-28 was significantly correlated with overall stroke average for men and women, even after statistically controlling for ratings of physical talent and social desirability, indicating that the ACSI-28 had unique predictive utility. The results concerning the subscales of this measure were somewhat different for men and women. Several of the subscales (Confidence and Achievement Motivation, Goal Setting and Mental Preparation, Peaking under Pressure, and Control of Worry for the women and Confidence and Achievement Motivation, Goal

Setting and Mental Preparation, Peaking under Pressure, Control of Worry, and Concentration for the men) were significantly correlated with overall stroke average after controlling for Marlowe-Crowne score. However, when physical ability was also statistically taken into account, the same four subscales remained significant for the women but only the Control of Worry subscale remained significant for the men. In short, more of the ASCI-28 subscales were still significantly correlated with stroke average for women than men after physically ability was controlled for.

Another gender difference emerged with respect to the number of rounds played performance measure. While the ACSI-28 generated similar significant correlations for both stroke average and rounds played with the men, it was surprisingly uncorrelated with rounds played for the women. These same results were obtained for each of the other self-report measures as well and it is uncertain as to why this was the case.

The ACSI-28 continued to be an important predictor for both men and women at the Pac-10 Tournament. The Total Coping Skills score and the Concentration, Confidence and Achievement Motivation, and Goal Setting and Mental Preparation subscales were all significant predictors of Pac-10 tournament stroke average for men, after controlling for physical skills and Marlowe-Crowne score. Interestingly, the Control of Worry subscale, which had been the best predictor of overall stroke average for the men, was not significantly correlated with the Pac-10 Tournament stroke average. For the women, the Total Coping Skills score was significantly correlated with Pac-10 tournament stroke average, but Coping with Adversity was the only additional subscale to produce significant partial correlations with Pac-10 tournament stroke average after controlling for social desirability and physical skill.

As can be seen from the discussion above, the ACSI-28 was a strong correlate of performance, but when used as a discriminator, it was somewhat less effective. This measure was able to significantly discriminate between men who did and did not earn the right to participate in the Pac-10 Tournament. It was unable to make a similar significant distinction for the women. The lack of significance for the women of this result may have been due to the smaller sample size and to the fact that a larger percentage of the women in the study competed at the Pac-10 Tournament (64% of the women compared to 53% of the men). In addition, the ACSI-28 was also unable to discriminate between men or women who did and did not make a double-bogey or worse during the final 18 holes of the Pac-10 tournament.

Compared to the results obtained by Smith and Christensen (1995) who used the same self-report measure, the ACSI-28 appeared to be a better predictor of performance for intercollegiate golfers than for professional baseball players. For professional baseball players, only the Confidence and Achievement Motivation subscale was significantly correlated with batting average and the Confidence and Achievement Motivation and Peaking under Pressure subscales were significantly correlated with earned run average. Furthermore, the Total Coping Skills score was not significantly correlated with either of these measures of baseball performance. In the present study, three subscales for the men (Confidence and Achievement Motivation, Peaking under Pressure, and Control of Worry), four subscales for the Women (Confidence and Achievement Motivation, Goal Setting and Mental Preparation, Peaking under Pressure, and Control of Worry), and the Total Coping Skills score for both genders were all significantly correlated with overall stroke average. These differences in significance between the two studies do not seem to be directly attributable to differences in subject size (position players: $\underline{N} = 57$; pitchers: $\underline{N} = 47$), since most of the correlations in the

present study are in fact larger than the corresponding correlations obtained in the Smith and Christensen study. It is possible that the correlations in the professional baseball player study would have been strengthened had social desirability been statistically taken into account but the Marlowe-Crowne measure was not administered in this study. It is worth noting that the Confidence and Achievement Motivation and Peaking under Pressure subscales were significant predictors in both studies, suggesting that these subscales may be particularly robust correlates of athletic performance.

The psychological skill ratings completed by the college coaches were also significant predictors of performance. In fact, prior to controlling for physical skills, the ACSI Rating Form and its subscales were generally stronger correlates of golf performance than the ACSI-28. However, once physical skills were statistically controlled, the ACSI Rating Form was actually a less significant predictor of performance. This particular pattern of results might have been caused by the coaches' inability to adequately separate the physical and psychological ratings of their team members. Correlations between the two sets of measures were notably high and were noticeably higher than similar correlations obtained in the Smith and Christensen study. In the previous study, the Total Coping Skills score from the ACSI Rating Form was correlated.29 ($p < .05$) with the measure of physical ability and only two other subscales yielded significant correlations (Coachability: $r = .28$, $p < .05$; Peaking under Pressure: $r = .39$, $p < .01$). This is in rather sharp contrast to the results of the present study, where all of the ACSI Rating Form subscales for both men and women were significantly correlated with the measure of physical ability. In addition, the Total Coping Skills score from the ACSI Rating Form was highly correlated with the Physical Skills Rating Form Total Score ($r = .69$ for the women and $r = .64$ for the men).

This difference in results between the two studies has several potential causes. It is possible that mental and physical skills are in actuality highly correlated and that the correlations observed in the present study are accurately reflecting this. It would make intuitive sense that at more advanced levels in sport, athletes need to have strong mental and physical abilities to excel, succeed, and survive. Another possible and perhaps more likely explanation focuses on differences in the how the physical ability measures were collected in the two studies. In the baseball study, the psychological and physical skill measures were completed by different people and at different times, while in the present study they were completed by the same person at the same time (one after the other). In addition, the measure of physical ability utilized in the Smith and Christensen study was a rather sophisticated and systematic measure that the organization had been keeping track of on their own for many years. In the present study, the measure of physical ability was created specifically for this study as no such indicator of physical talent existed. It is possible that in the present study this variance overlap could have been reduced if there was a larger separation between completing the psychological and physical skills measures and future researchers utilizing this methodology may want to keep this in mind.

An important finding of the present study concerned social desirability and the overall effectiveness of including a short form of the Marlowe-Crowne in the initial questionnaire. The average Marlowe-Crowne scores were relatively high in this study, particularly for the women, indicating that social desirability was present at a relatively high level in this study. When social desirability was partialed out of the results, correlations of with performance were consistently strengthened, by as much as .10.

Another interesting result concerned the general lack of agreement between corresponding scales on the ACSI-28 and the ACSI-Rating Form. Though many of the

correlations between the scales were significant, they were not as high as would be expected and there was also the problem on a few scales of having higher non-corresponding than corresponding subscale correlations. For instance, the Concentration subscale on the ACSI Rating Form was more strongly correlated with the Coachability subscale on the ACSI-28 than the Concentration subscale on the ACSI-28. This lack of agreement between these two measures was also obtained in the Smith and Christensen (1995) study. In fact, the correlations between the two Total Coping Skills scores for men and women college golfers of .49 and .38 respectively are similar to the corresponding correlations obtained for pitchers ($r = .48$) and position players ($r = .31$). Despite this lack of agreement, each of these measures still was an important and significant predictor of golf performance. Though thought to be measuring the same constructs, the coach and player ratings of psychological skills appear to be tapping into distinct yet still important correlates of successful athletic performance.

Though the design of the present study was correlational, structural equation modeling provided information on the potential causal influence of psychological factors. Results from structural equation modeling revealed that all three of the models tested fit the data well. In Model 1, which attempted to predict men's spring season golf performance, there was a significant structural path between the Trait Psychological Factor and the Golf Performance, suggesting the presence of a direct causal relation between these two latent variables. In fact, this path coefficient was slightly larger than the path coefficient between Physical Ability and Golf Performance, indicating that the psychological factor had slightly stronger predictive impact on golf performance for the men. Examination of the disturbance term indicated that the model accounted for a substantial 46% of the variation in the Golf Performance latent variable.

Multiple-group analyses on both the men and women using Model 1 failed to yield any statistically significant gender differences, but inspection of the data revealed at least one important contrast. The direct path between the Trait Psychological Factor and Golf Performance was not significant ($z = 1.47$). Despite the lack of significance of this path, the overall model accounted for 47% of the variation of the Golf Performance latent variable, a number almost identical to the one observed with the men.

It is also worth noting that the results these analyses support the decision to include the rounds played variable as an outcome measure. The rounds played variable resulted in significant factor loadings on the Golf Performance variable for both genders, though the size of the factor loading was somewhat lower for the women than the men (.58 for women vs. .79 for men). It is somewhat puzzling that the rounds played variable loaded positively on golf performance for the women yet was consistently uncorrelated with any of the psychological measures (See Table 15).

Model 2 attempted to predict the golf performance of individuals competing at the Pac-10 Championship. The Comparative Fit Index (CFI) of .94 revealed that this model also fit the data well and multiple-group analyses again failed to yield any significant gender differences. Despite the results of this test, examination of the data revealed a different pattern of results depending on gender. This time, the direct path from the State Psychological Factor to Pac-10 Golf Performance was significant for the women and not the men. The structural path coefficient of .45 for the women was even slightly larger than the path of .42 between the Physical Skill variable and Pac-10 Golf Performance. For the men, neither the State Psychological Factor nor the Physical Skills latent variables yielded statistically significant path coefficients to Pac-10 Golf Performance. The structural path from the State Psychological variable was a sizable .58 but the z-score for this coefficient just failed to reach significance ($z = 1.84$). This was somewhat

surprising since examination of the disturbance term revealed that the entire model accounted for 47% of the variation of the Golf Performance latent variable.

The final set of structural analyses addressed the utility of the trait psychological measures, assessed 2-3 months earlier, in modeling performance at the Pac-10 Tournament. Analyses revealed that all model coefficients were statistically significant except for the structural path between the Trait Psychological Factor and Pac-10 Tournament Stroke Average for men and women. It is worth noting, however, that the z-score for the men's path coefficient just missed significance ($z = 1.93$). If this path had been significant, the results from this model would have paralleled the results obtained from Model 1. The lack of significance of this structural path may have been due in part to the smaller sample sizes.

The CFI for the non-constrained Model 3 was quite high (.98), indicating a good fit of the data to the model, but examination of the Pac-10 Tournament Stroke Average error terms revealed that this final model accounted for only 29% variance of this performance variable for men and women. This is noticeably lower than the corresponding percentages of 50% (men) and 47% (women) obtained for Model 2. Thus, as would be typically expected, the state psychological measures modeled Pac-10 tournament performance more effectively than the trait measures. As was the case for Models 1 and 2, comparison of chi-squares from the constrained and unconstrained models failed to yield a statistically significant gender difference. However, follow-up tests did reveal a statistically significant gender difference on the Trait Golf Self-Efficacy factor loading (.55 for men; .85 for women). This was the first such significant difference obtained in the study. Despite this last finding, the overall results from the study suggest that the structural models for men and woman intercollegiate golfers are more or less similar.

The results of the present study indicated that psychological factors such as self-efficacy, cognitive interference, and psychological coping skills are all important correlates of golf performance, often even after physical factors have been statistically controlled. Social desirability also proved to be an important variable to take into consideration. Marlowe-Crowne scores were relatively high with this population and correlations between the primary psychological factors and the performance measures were consistently strengthened by statistically controlling for social desirability. Given the relative ease of administering this measure (it has only 13 items), future researchers would do well to include it whenever utilizing self-report scales and measures.

Structural equation modeling provided some evidence regarding the causal impact of psychological factors on athletic performance and while not conclusive, the results were encouraging. Sport psychology research would benefit if this powerful statistical technique were utilized more often. Overall, this study provides important quantitative support, to balance out the extensive amount of qualitative research, suggesting the import and value of mental skills.

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APPENDIX A: Consent Form

University of Washington
Consent/Assent Form
Pac-10 Golf Study

Investigators: Donald S. Christensen, Doctoral Student in Clinical Psychology, Department of Psychology, phone: (206) 685-0866.
Ronald E. Smith, Professor of Psychology, Department of Psychology, phone: (206) 543-8817.

Investigator's Statement:
PURPOSE AND BENEFITS

This research project is designed to study the importance of psychological and physical skills as predictors of success in intercollegiate golf. At the conclusion of the study, the results concerning which psychological skills were positively associated with performance will be shared with all participants. In addition, a psychological skills training manual will be developed based on the results of the study and distributed to all participants.

PROCEDURES
The study involves completing a short questionnaire designed to assess different psychological skills such as imagery and concentration. The questionnaire should take no more than 15 minutes to complete. At the same time, coaches will be asked to rate each of their player's psychological and physical skills using two different rating forms. One more short questionnaire will be administered prior to the start of the Pac-10 tournament. At the end of the intercollegiate golf season, stroke averages and the number of competitive rounds completed by each player along with other golf statistics will be collected from coaches. Statistical analyses will then be used to determine which psychological skills were associated with success during the year.

RISKS, STRESS, OR DISCOMFORT
As the questions on the questionnaire are of a non-threatening nature, the risk of threat or discomfort would seem to be negligible.

OTHER INFORMATION

All data gathered during this study will be confidential. The data from each subject will initially be linked to that individual's name, but only Dr. Smith and I will have access to this file. After all the data have been collected, participants will be identified by code number only. Subjects may refuse to participate or may withdraw their consent at any time.

_____ _____
Signature of investigator Date

Subject's Statement:
The study above has been explained to me. I voluntarily consent to participate in this activity. I understand that future questions I may have about the research or about my rights as a subject will be answered by one of the investigators listed above.

_____ _____
Signature of participant Date

Copies to: Subject
Investigator's file

APPENDIX B: Trait Golf Self-Efficacy Scale
General Confidence Rating Form

Instructions: When answering the questions below, please base your rating on how you normally feel about each of these areas, not on just how you feel about them lately.

In general, how confident are you in your ability to consistently...

	not at all confident					moderately confident					completely confident
make putts inside 6 feet.	0	1	2	3	4	5	6	7	8	9	10
make 50% of 10-15 foot putts.	0	1	2	3	4	5	6	7	8	9	10
lag long putts (outside 30 feet) to within 3 feet of the hole.	0	1	2	3	4	5	6	7	8	9	10
get the ball within 6 feet of the pin from green side bunkers.	0	1	2	3	4	5	6	7	8	9	10
chip the ball within 6 feet of the pin from anywhere around the green.	0	1	2	3	4	5	6	7	8	9	10
pitch the ball within 10 feet of the pin from 100 yards and in.	0	1	2	3	4	5	6	7	8	9	10
hit short irons (W-8 iron) within 15 feet of the hole.	0	1	2	3	4	5	6	7	8	9	10
hit medium irons (7-5 iron) within 20 feet of the hole.	0	1	2	3	4	5	6	7	8	9	10
hit long irons (4-2 iron) within 30 feet of the hole.	0	1	2	3	4	5	6	7	8	9	10
hit your fairway woods close to or onto the green on par fives.	0	1	2	3	4	5	6	7	8	9	10
drive the ball long.	0	1	2	3	4	5	6	7	8	9	10
drive the ball straight/in the fairway.	0	1	2	3	4	5	6	7	8	9	10
play well in the wind.	0	1	2	3	4	5	6	7	8	9	10
play well in the rain.	0	1	2	3	4	5	6	7	8	9	10

APPENDIX C: Athletic Coping Skills Inventory (ACSI) - 28
SURVEY OF ATHLETIC EXPERIENCES

DIRECTIONS: A number of statements that golfers have used to describe their experiences are given below. Please read each statement carefully and then recall as accurately as possible how often you experience the same thing. There are no right or wrong answers. Do not spend too much time on any one statement.

Please circle how often you have these experiences when playing golf.

1. On a daily or weekly basis, I set very specific goals for myself that guide what I do.

   Almost Never **Sometimes** **Often** **Almost Always**

2. I get the most out of my talent and skills.

   Almost Never **Sometimes** **Often** **Almost Always**

3. When a coach tells me how to correct a mistake I've made, I tend to take it personally and feel upset.

   Almost Never **Sometimes** **Often** **Almost Always**

4. When I'm playing golf, I can focus my attention and block out distractions.

   Almost Never **Sometimes** **Often** **Almost Always**

5. I remain positive and enthusiastic during competition, no matter how badly things are going.

   Almost Never **Sometimes** **Often** **Almost Always**

6. I tend to play better under pressure because I think more clearly.

   Almost Never **Sometimes** **Often** **Almost Always**

7. I worry quite a bit about what others will think of my performance.

Almost Never **Sometimes** **Often** **Almost Always**

8. I tend to do lots of planning about how to reach my goals.

Almost Never **Sometimes** **Often** **Almost Always**

9. I feel confident that I will play well.

Almost Never **Sometimes** **Often** **Almost Always**

10. When a coach criticizes me, I become upset rather than helped.

Almost Never **Sometimes** **Often** **Almost Always**

11. It is easy for me to keep distracting thoughts from interfering with something I am watching or listening to.

Almost Never **Sometimes** **Often** **Almost Always**

12. I put a lot of pressure on myself by worrying about how I will perform.

Almost Never **Sometimes** **Often** **Almost Always**

13. I set my own performance goals for each practice.

Almost Never **Sometimes** **Often** **Almost Always**

14. I don't have to be pushed to practice or play hard; I give 100%..

Almost Never **Sometimes** **Often** **Almost Always**

15. If a coach criticizes or yells at me, I correct the mistake without getting upset about it.

Almost Never **Sometimes** **Often** **Almost Always**

16. I handle unexpected situations in golf very well.

Almost Never **Sometimes** **Often** **Almost Always**

17. When things are going badly, I tell myself to keep calm, and this works for me.

Almost Never **Sometimes** **Often** **Almost Always**

18. The more pressure there is during a round, the more I enjoy it.

Almost Never **Sometimes** **Often** **Almost Always**

19. While competing, I worry about making mistakes or not coming through.

Almost Never **Sometimes** **Often** **Almost Always**

20. I have my own course strategy worked out in my head long before I play a competitive round.

Almost Never **Sometimes** **Often** **Almost Always**

21. When I feel myself getting too tense, I can quickly relax my body and calm myself.

Almost Never **Sometimes** **Often** **Almost Always**

22. To me, pressure situations are challenges that I welcome.

Almost Never **Sometimes** **Often** **Almost Always**

23. I think about and imagine what will happen if I fail or screw up.

Almost Never **Sometimes** **Often** **Almost Always**

24. I maintain emotional control regardless of how things are going for me.

Almost Never **Sometimes** **Often** **Almost Always**

25. It is easy for me to direct my attention and focus on a single object or person.

Almost Never **Sometimes** **Often** **Almost Always**

26. When I fail to reach my goals, it makes me try even harder.

Almost Never **Sometimes** **Often** **Almost Always**

27. I improve my skills by listening carefully to advice and instruction from coaches.

Almost Never **Sometimes** **Often** **Almost Always**

28. I make fewer mistakes when the pressure is on because I concentrate better.

Almost Never **Sometimes** **Often** **Almost Always**

APPENDIX D: Sport Anxiety Scale (SAS)

REACTIONS TO COMPETITION

Instructions: A number of statements which athletes have used to describe their thoughts and feelings before or duruing a competition are listed below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you usually feel prior to or during a competition. Some athletes feel they should not admit to feelings of nervousness or worry, but such reactions are actually quite common, even among professional athletes. To help us better understand reactions to competition, we ask you to share your true reactions with us. There are, therefore, no right or wrong answers. Do not spend too much time on any one statement, but choos the answer which describes how you commonly react.

		Not at All	Somewhat	Moderately So	Very Much So
1.	I fell nervous...	1	2	3	4
2.	During competition, I find myself thinking about unrelated things...	1	2	3	4
3.	I have self-doubts...	1	2	3	4
4.	My body feels tense...	1	2	3	4
5.	I am concerned that I may not do as well in competition as I could...	1	2	3	4
6.	My mind wanders during sport competition...	1	2	3	4
7.	While peforming, I often do not pay attention to what's going on...	1	2	3	4
8.	I feel tense in my stomach...	1	2	3	4
9.	Thoughts of doing poorly interfere with my concentration during competition...	1	2	3	4
10.	I am concerned about choking under pressure...	1	2	3	4
11.	My heart races...	1	2	3	4

		Not at All	Somewhat	Moderately So	Very Much So
12.	I feel my stomach sinking	1	2	3	4
13.	I'm concerned about performing poorly...	1	2	3	4
14.	I have lapses in concentration during competition because of nervousness...	1	2	3	4
15.	I sometimes find myself trembling before a competitive event...	1	2	3	4
16.	I'm worried about reaching my goal...	1	2	3	4
17.	My body feels tight...	1	2	3	4
18.	I'm concerned that others will be disappointed in me...	1	2	3	4
19.	My stomach gets upset before or during a competition...	1	2	3	4
20.	I'm concerned I won't be able to concentrate...	1	2	3	4
21.	My heart pounds before competition...	1	2	3	4

APPENDIX E: Short Form Marlowe-Crowne Social Desirability Scale
PERSONAL REACTIONS

Listed below are a number of statements concerning personal reactions. Read each item and decide whether the statement is true (T) or false (F) as it pertains to you personally. Circle the letter in front of each number.

T F 1. It is sometimes hard for me to go on with my work if I am not encouraged.

T F 2. I sometimes feel resentful when I don't get my way.

T. F. 3. On a few occasions, I have given up doing something because I thought too little of my ability.

T F 4. There have been times when I felt like rebelling against people in authority even thought I knew they were right.

T F 5. No matter who I'm talking to, I'm always a good listener.

T F 6. There have been occasions when I took advantage of someone.

T F 7. I'm always willing to admit it when I make a mistake.

T F 8. I sometimes try to get even rather than forgive and forget.

T F 9. I am always courteous, even to people who are disagreeable.

T F 10. I have never been irked when people expressed ideas very different from my own.

T F 11. There have been times when I was quite jealous of the good fortune of others.

T F 12. I am sometimes irritated by people who ask favors of me.

T F 13. I have never deliberately said something that hurt someone's feelings.

APPENDIX F: Athletic Coping Skills Inventory (ACSI) Rating Form

Psychological Skills Rating Form

Player's Name: _____

Please rate this player on each of the following psychological attributes in comparison with other players at the Division I level. Use the following scale in making your rating.

1 = Far below average
2 = Below average
3 = Average
4 = Above average
5 = Far above average

Rating

___ **Peaking Under Pressure:** Is challenged rather than threatened by pressure situations and performs well under pressure; a clutch performer.

___ **Control of Worry:** Does not create pressure by worrying about performing poorly or making mistakes; does not worry about what others will think if he/she performs poorly.

___ **Coping with Adversity:** Remains positive and enthusiastic even when things are going badly; remains calm and controlled; can quickly bounce back from mistakes and setbacks.

___ **Concentration:** Not easily distracted; able to focus on the task at hand in both practice and tournament situations, even when adverse or unexpected situations occur.

___ **Goal Setting and Mental Preparation:** Sets and works toward specific performance goals; plans and mentally prepares for tournaments and develops specific course management strategies.

___ **Confidence and Motivation:** Is confident and positively motivated; consistently give's 100% in practice and tournaments and works hard to improve skills.

___ **Coachability:** Open to and learns from instruction; accepts constructive criticism without taking it personally and becoming upset.

APPENDIX G: Physical Skills Rating Form

Physical Skills Rating Form

Player's Name: _____

Compared to other college golfers at this level, please rate this player in each of the following areas. Rate each of these area based on how the player performs in practice and non-competitive situations with minimal pressure. Use the following scale in making your rating:

well below average		below average		average		above average		well above average
1	2	3	4	5	6	7	8	9

____ Putting

____ Short Game (chipping, pitching, greenside bunkers, finese shots, less than full wedge shots)

____ Long Game

APPENDIX H: State Golf Self-Efficacy Scale
Specific Confidence Rating Form

When answering the questions below, please base your rating on how you feel about each of these areas **right now**.

At the moment, how confident are you in your ability to consistently...

	not at all confident					moderately confident					completely confident
make putts inside 6 feet.	0	1	2	3	4	5	6	7	8	9	10
make 50% of 10-15 foot putts.	0	1	2	3	4	5	6	7	8	9	10
lag long putts (outside 30 feet) to within 3 feet of the hole.	0	1	2	3	4	5	6	7	8	9	10
get the ball within 6 feet of the pin from green side bunkers.	0	1	2	3	4	5	6	7	8	9	10
chip the ball within 6 feet of the pin from anywhere around the green.	0	1	2	3	4	5	6	7	8	9	10
pitch the ball within 10 feet of the pin from 100 yards and in.	0	1	2	3	4	5	6	7	8	9	10
hit short irons (W-8 iron) within 15 feet of the hole.	0	1	2	3	4	5	6	7	8	9	10
hit medium irons (7-5 iron) within 20 feet of the hole.	0	1	2	3	4	5	6	7	8	9	10
hit long irons (4-2 iron) within 30 feet of the hole.	0	1	2	3	4	5	6	7	8	9	10
hit your fairway woods close to or onto the green on par fives.	0	1	2	3	4	5	6	7	8	9	10
drive the ball long.	0	1	2	3	4	5	6	7	8	9	10
drive the ball straight/in the fairway.	0	1	2	3	4	5	6	7	8	9	10
play well in the wind.	0	1	2	3	4	5	6	7	8	9	10
play well in the rain.	0	1	2	3	4	5	6	7	8	9	10

APPENDIX I: Cognitive Interference Questionnaire (CIQ) For Golfers

Thoughts During the Tournament

Instructions: This questionnaire concerns the kinds of thought that go through golfers' heads when they are playing golf. The following is a list of of thoughts, some of which you might have had **during the tournament you just completed**. Please indicate approximately how often each thought occurred to you while playing by placing the appropriate number in the blank to the left of the question.

1 = Never
2 = Once
3 = A few times
4 = Often
5 = Very often

____ I thought about what it would be like to win or finish high in the tournament.

____ I thought about my team mates praising me for playing well.

____ I thought about my coach praising me for playing well.

____ I thought about how significant others (e.g parents, boy/girlfriend, friends) would praise me if I played well.

____ I thought about how good I would feel at the end of the round/tournament if I played well.

____ I thought about how well I was playing.

____ I worried about what my team mates thought of me.

____ I worried about what my coach thought of me.

____ I thought about how badly I would feel at the end of the round/tournament if I played poorly.

____ I thought about how significant others (e.g parents, boy/girlfriend, friends) would be disappointed in me if I played poorly.

____ I thought about hitting bad shots that I really didn't want to hit (for example, I saw myself hitting the ball into the water or out of bounds).

____ I thought about past bad shots I'd hit or bad holes I'd played.

____ I thought about letting my team mates down

____ I thought about letting my coach down.

____ I thought about how badly I was playing.

____ I thought about how I should try harder.

____ I thought about giving up.

____ I compared how I was playing to how my teammates were playing.

____ I thought about things unrelated to the round (e.g. school, boy/girlfriend, etc...).

For each of the following questions, please circle your response.

1. During the tournament you just completed, how much did your mind wander ?

1	2	3	4	5	6	7
Not at all						Very Much

2. During the tournament you just completed, how much did you think about the negative consequences of playing poorly (e.g. disappointing your coach and teammates, letting the team down, etc...) .

1	2	3	4	5	6	7
Not at all						Very Much

3. During the tournament you just completed, how much did you think about the positive consequences of playing well (e.g. winning the tournament, receiving praise from your coach, teammates, and friends, etc...).

1	2	3	4	5	6	7
Not at all						Very Much

4. During the tournament you just completed, how did thoughts about the negative consequences of playing poorly (e.g. letting your coach and teammates, disappointing your parents and friends, etc...) effect your play.

1	2	3	4	5	6	7
Hurt my play			Didn't help or hurt			Helped my play

5. During the tournament you just completed, how did thoughts about the positive consequences of playing well (e.g. winning the tournament, receiving praise from your coach, teammates, and friends, etc...) effect your play.

1	2	3	4	5	6	7
Hurt my play			Didn't help or hurt			Helped my play

APPENDIX J: Confirmatory Factor Analysis of The Athletic Coping Skills Inventory-28

Standardized Path Coefficients and Test Statistics (Z) for Confirmatory Factor Analysis of the ACSI-28 (n = 196)

Relationship	Path	Z
Factor -> Item		
Coping with Adversity -> Item 5	.65	9.31
Coping with Adversity -> Item 17	.62	8.73
Coping with Adversity -> Item 21	.68	9.85
Coping with Adversity -> Item 24	.65	9.31
Coachability -> Item 3	.63	8.44
Coachability -> Item 10	.72	9.75
Coachability -> Item 15	-.73	9.84
Coachability -> Item 27	-.34	4.31
Concentration -> Item 4	.74	10.90
Concentration -> Item 11	.49	6.59
Concentration -> Item 16	.57	7.90
Concentration -> Item 25	.61	8.54
Confidence -> Item 2	.59	8.41
Confidence -> Item 9	.77	11.81
Confidence -> Item 14	.61	8.80
Confidence -> Item 26	.58	8.20
Goal Setting -> Item 1	.75	11.29
Goal Setting -> Item 8	.78	11.88
Goal Setting -> Item 13	.72	10.72
Goal Setting -> Item 20	.55	7.60
Peaking under Pressure -> Item 6	.77	12.22
Peaking under Pressure -> Item 18	.89	15.35
Peaking under Pressure -> Item 22	.83	13.64
Peaking under Pressure -> Item 28	.68	10.34
Freedom from Worry -> Item 7	.66	9.42
Freedom from Worry -> Item 12	.65	9.22
Freedom from Worry -> Item 19	.67	9.51
Freedom from Worry -> Item 23	.73	10.58
Factor Intercorrelations		
Adversity <-> Coachability	-.37	4.24
Adversity <-> Concentration	.81	14.58
Adversity <-> Confidence	.58	7.99
Adversity <-> Goal Setting	.30	3.55
Adversity <-> Peaking under Pressure	.58	9.00
Adversity <-> Freedom from Worry	-.60	8.64
Coachability <-> Concentration	-.39	4.52
Coachability <-> Confidence	-.23	2.50
Coachability <-> Goal Setting	-.10	1.06
Coachability <-> Peaking under Pressure	-.26	3.20
Coachability <-> Freedom from Worry	.28	3.21

Appendix J Continued.

Relationship	Path	Z
Concentration <-> Confidence	.78	13.18
Concentration <-> Goal Setting	.47	5.97
Concentration <-> Peaking under Pressure	.57	8.50
Concentration <-> Freedom from Worry	-.53	6.97
Confidence <-> Goal Setting	.72	12.65
Confidence <-> Peaking under Pressure	.68	12.06
Confidence <-> Freedom from Worry	-.54	7.40
Goal-Setting <-> Peaking under Pressure	.33	4.30
Goal-Setting <-> Freedom from Worry	-.25	2.89
Peaking <-> Freedom from Worry	-.54	8.19
CFI = .86		
χ^2(df = 329, N = 196) = 628.4		

APPENDIX K: Confirmatory Factor Analysis of the Sport Anxiety Scale

Standardized Path Coefficients and Test Statistics (Z) for Confirmatory Factor Analysis of the Sport Anxiety Scale (n = 196)

Relationship	Path	Z
Factor -> Item		
Concentration Disruption -> Item 2	.76	11.25
Concentration Disruption -> Item 6	.82	12.26
Concentration Disruption -> Item 7	.40	5.23
Concentration Disruption -> Item 14	.48	6.52
Concentration Disruption -> Item 20	.57	7.94
Somatic -> Item 1	.71	11.04
Somatic -> Item 4	.73	11.39
Somatic -> Item 8	.75	11.73
Somatic -> Item 11	.66	9.91
Somatic -> Item 12	.71	10.96
Somatic -> Item 15	.67	10.24
Somatic -> Item 17	.69	10.53
Somatic -> Item 19	.65	9.74
Somatic -> Item 21	.66	9.87
Worry -> Item 3	.78	12.52
Worry -> Item 5	.73	11.44
Worry -> Item 9	.81	13.37
Worry -> Item 10	.75	11.94
Worry -> Item 13	.82	13.71
Worry -> Item 16	.60	8.91
Worry -> Item 18	.72	11.30
Factor Intercorrelations		
Concentration Disruption <-> Somatic	.40	5.45
Concentration Disruption <-> Worry	.51	7.75
Somatic <-> Worry	.66	13.39
CFI = .84		
χ^2 (df = 186, N =196) = 516.9		

APPENDIX L: Confirmatory Factor Analysis of the Trait Golf Self-Efficacy Scale

Standardized Path Coefficients and Test Statistics (z-scores) for Confirmatory Factor Analysis of the General Self-Efficacy Measure (n = 196)

Relationship	Path	Z
Factor -> Item		
Putting Efficacy -> Item 1	.76	11.93
Putting Efficacy -> Item 2	.91	15.38
Putting Efficacy -> Item 3	.67	10.11
Short Game Efficacy -> Item 4	.66	9.91
Short Game Efficacy -> Item 5	.65	9.68
Short Game Efficacy -> Item 6	.79	12.49
Iron Efficacy -> Item 7	.84	14.11
Iron Efficacy -> Item 8	.94	16.92
Iron Efficacy -> Item 9	.78	12.68
Wood Efficacy -> Item 10	.63	8.14
Wood Efficacy -> Item 11	.54	6.90
Wood Efficacy -> Item 12	.58	7.50
Diffcult Condition Efficacy -> Item 13	.75	11.01
Diffcult Condition Efficacy -> Item 14	.81	11.97
Factor Intercorrelations		
Putting <-> Short Game	.83	18.95
Putting <-> Irons	.60	10.92
Putting <-> Woods	.45	5.24
Putting <-> Difficult Condition	.63	10.31
Short Game <-> Irons	.81	19.36
Short Game <-> Woods	.59	7.09
Short Game <-> Difficult Condition	.69	10.73
Short Irons <-> Woods	.52	6.67
Short Irons <-> Difficult Condition	.46	6.65
Woods <-> Difficult Condition	.83	12.20
CFI = .91		
χ^2 (df = 67, N = 196) = 182.9		

CURRICULUM VITA

Donald S. Christensen

17320 73rd Avenue West
Edmonds, Washington 98026

Office: (206) 719-0540 Fax: (425) 743-1538
Home: (425) 743-4819 e-mail: underpar@u.washington.edu

EDUCATION

2000 **Doctor of Philosophy: Adult Clinical Psychology,** University of Washington, Seattle, WA

1995 **Master of Science: Adult Clinical Psychology,** University of Washington, Seattle, WA

1990 **Bachelor of Arts: Psychology (with honors),** Stanford University, Stanford, CA

CLINICAL & PRACTICUM EXPERIENCE

8/98-present **Doctoral Intern. Counseling and Consultation, Arizona State University (APA Accredited).** Responsibilities and training have included individual, couples, and group counseling, outreach and consultation, supervision, supervision practicum, crisis intervention, staff meetings and in-service training, and dissertation research.

1/95-1/96 **Psychology Intern. Mental Health Clinic, Hall Health Primary Care Center, University of Washington.** Worked as a staff therapist one day/week and maintained caseload of approximately 4-5 students. Received weekly individual supervision. Attended weekly staff meetings and practicum seminar.

9/93-6/98 **Staff Therapist. Psychological Services and Training Clinic, University of Washington.** Worked as a therapist in the psychology training clinic. Maintained approximate caseload of 3 clients/week and gained group co-leading experience.

9/93-9/95 **Staff Consultant. Husky Sport Psychology Services (HSPS), Department of Intercollegiate Athletics, University of Washington.** Conducted individual sessions with student-athletes, made team presentations on various mental training topics (e.g., goal-setting, anxiety management, imagery, etc.), and provided consultation to coaches on relevant issues. Also facilitated referrals to campus counseling resources.

TEACHING & RESEARCH EXPERIENCE

Spring 1998 — **Co-Instructor. Department of Psychology, University of Washington.**
Co-taught 3-unit "Teaching of Psychology" graduate course with Senior Lecturer. Class focused on the elements of effective teaching, course development, and relevant pedagogical issues.

Winter 1997 — **Instructor. Department of Psychology, University of Washington.**
Created and taught 4-unit "Fundamentals of Psychological Research" undergraduate course. Course introduced students to the various research methods of psychology.

Spring 1997 — **Instructor. Department of Psychology, University of Washington.**
Created and taught 3-unit "Writing about Abnormal Psychology" undergraduate course. Course focused on developing both general and scientific writing skills, using the field of abnormal psychology for content.

9/96-6/98 — **Lead Teaching Assistant. Department of Psychology, University of Washington.** Responsibilities included coordinating new graduate student orientation, leading several introductory teaching seminars, organizing departmental teaching workshops, and making confidential, in-class observations of TAs to provide feedback on teaching.

9/92-6/93
9/95-8/96 — **Teaching Assistant. Department of Psychology, University of Washington.** Worked as teaching assistant for several different undergraduate and graduate courses, including Introduction to Personality Theory, Fundamentals of Psychological Research, Psychology as Social Science (i.e., Psychology 101), Adult Psychological Assessment, and Human Performance Enhancement.

CONSULTATION EXPERIENCE

9/92-6/93 — **Consultant. Office of Greek Life, Arizona State University.**
Conducted initial needs assessment, facilitated staff discussion of communication difficulties, and provided staff development training (e.g., MBTI feedback session and goal-setting presentation).

9/93-9/95 — **Staff Consultant. Husky Sport Psychology Services (HSPS), Department of Athletics, University of Washington.** See CLINICAL & PRACTICUM EXPERIENCE section.

RESEARCH

Publications

Smith, R.E., & Christensen, D.S. (1995). Psychological skills as predictors of performance and survival in professional baseball. *Journal of Sport and Exercise Psychology, 17*, 399-415.

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Professional Presentations

Cordova, D. I., Christensen, D. S., & Lepper, M. R. (1990). *Immunizing children against the negative effects of reward on the learning process.* Paper presented at the 70th annual meeting of the Western Psychological Association, Los Angeles, CA.

Cordova, D. I., Christensen, D. S., & Lepper, M. R. (1990). *Immunizing children against the detrimental effects of reward.* Paper presented at the 98th annual convention of the American Psychological Association, Boston, MA.

Christensen, D. S., and Smith, R. E. (1994). *Psychological and physical skills as predictors of performance in professional baseball.* Poster presented at the 9th annual convention of the Association for the Advancement of Applied Sport Psychology (AAASP), Incline Village, NV.

Christensen, D. S., and Smith, R. E. (1995) *Psychological and physical skills as predictors of survival in professional baseball.* Talk presented at the 10th annual convention of the Association for the Advancement of Applied Sport Psychology (AAASP), New Orleans, LA.

Unpublished Work

Christensen, D. S., Cordova, D. I., & Lepper, M. R., (1990). *Immunizing children against the negative effects of rewards on the process of learning.* Unpublished manuscript, Stanford University.

Christensen, D. S. (1999). *Self-Efficacy, cognitive interference, and psychological skills as predictors of intercollegiate golf performance.* Unpublished manuscript, University of Washington.

PROFESSIONALLY RELATED SERVICE (WORKSHOPS GIVEN)

1999

- Managing Conflict: A Key to Effective Leadership. Workshop presented to attendees of the 1999 Arizona State University Greek Leadership Conference. Tempe, AZ.

1997

- Mental Training for Baseball: A Key to Realizing Your Potential. Workshops presented to members of the Olympia High School Baseball Teams. Olympia, WA.

- An Introduction to the Mental Side of Golf. Workshop presented to participants of the Nike Junior Golf Camps. Snohomish, WA.

- Mental Training for Baseball: A Key to Realizing Your Potential. Workshops presented to high school baseball players at Dave Henderson's Ballyard Prospect Camp. Bellevue, WA.

1996

- An Introduction to Sport Psychology and its Application to Athletic Training and Fitness. Workshop presented to staff members of Sound Mind and Body Gym. Seattle, WA.

- Effective Goal Setting. Workshop presented to staff members of Sound Mind and Body Gym. Seattle, WA.

- Managing Competitive Anxiety: An Introduction to Mental Skills Training. Workshops presented to equestrians at Legacy Stables. Redmond, WA.

- Mental Training for Baseball: A Key to Realizing Your Potential. Workshops presented to high school baseball players at Dave Henderson's Ballyard Prospect Camp. Bellevue, WA.

- The Mental Side of Golf. Workshop presented to high school golfers and parents at the Lakeside School. Seattle, WA.

1995

- Mental Training for Baseball: A Key to Realizing Your Potential. Workshops presented to high school baseball players at Dave Henderson's Ballyard Prospect Camp. Bellevue, WA.