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JENNIFER RENEE CASTRO

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ATTENTIONAL DISTRACTION AND PERFECTIONISM: A TEST OF COMPETING MODELS OF MODERATION AND MEDIATION IN THE COGNITIVE ANXIETY-PERFORMANCE RELATIONSHIP

By

Jennifer Renee Castro

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ABSTRACT

ATTENTIONAL DISTRACTION AND PERFECTIONISM: A TEST OF COMPETING MODELS OF MODERATION AND MEDIATION IN THE COGNITIVE ANXIETY-PERFORMANCE RELATIONSHIP

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The present study examined competing models of the cognitive anxiety-performance relationship. The first model tested attentional distraction as a mediator between cognitive anxiety and two performance indicators: getting a hit and coaches' ratings of performance. The second model examined attentional distraction as a moderator of the cognitive anxiety-performance relationship (again, using getting a hit and coaches' ratings as performance indicators). Data were collected from 102 high school baseball and softball players from the West and Midwest. Results revealed that attentional distraction neither mediated nor moderated the relationship between cognitive anxiety and performance. However, results revealed a significant relationship between cognitive anxiety and attentional distraction, and a potential trend towards significance between cognitive anxiety and getting a hit. Results also revealed a significant relationship between attentional distraction and coaches' ratings of performance. Although analyses revealed that attentional distraction neither moderated nor mediated the cognitive anxiety-performance relationship, evidence of a potential indirect model emerged, with cognitive anxiety predicting attentional distraction, which predicted coaches' ratings of performance. In addition, the present study examined four dimensions of perfectionism as mediators in the cognitive anxiety-performance relationship. Results

revealed that none of the perfectionism dimensions mediated the proposed relationship. However, cognitive anxiety significantly predicted Concern over Mistakes and overall perfectionism. Exploratory gender analyses revealed that attentional distraction did not mediate the cognitive anxiety-performance relationship for males or females. Suggestions for future research and implications for practice follow a discussion of the results.

DEDICATION

First and foremost, I dedicate this dissertation, as well as my degree, to my husband Charles Houston Castro and my daughter Mariah Christina Castro. I never would have been able to complete this document without the countless number of hours Charles spent: 1) searching for, and photocopying, articles in the library; 2) assisting with printing survey materials and collecting data; 3) entering data; 4) providing computer support, including assistance with the daunting task of formatting; and 5) providing constant encouragement, love and support. This has been a long, hard road and I am so fortunate that I did not have to make this journey alone. I hope that this dissertation and degree will serve as a symbol to my daughter, Mariah, to follow her hopes and dreams, regardless of the difficulty or roadblocks she may encounter along the way. I thank them both for constantly reminding me to maintain balance in my life between work/school and fun/time spent with family and friends. I offer love and thanks to my parents, Jim and Diana Nipps for instilling in me the value of hard work, determination, and persistence, my father Richard Lewis for his love and support, and my sister Christina Lee for support, laughter, and fun throughout this journey. Finally, I thank my grandparents, Floyd and Agnes Songer, and Eugene and Billie Lewis, for their love, support, and presence in my life.

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Introduction

According to Gould and Krane (1992), anxiety refers to "feelings of nervousness and tension associated with activation or arousal of the organism" (p. 121). This construct has received considerable attention in the literature, through very distinct theories and models. A large portion of the anxiety research in sport psychology evolved from the general and test anxiety literature. For example, Spielberger (1966) proposed a trait-state theory of anxiety, reflecting the importance of distinguishing between the personality and emotional components of anxiety. State anxiety is characterized as an emotional state that can fluctuate from moment to moment, specifically with respect to the degree of threat perceived by the individual. Trait anxiety, on the other hand, is more stable, representing how an individual typically feels, and is often related to state anxiety. Spielberger suggested that people who are high in trait anxiety have a greater propensity to perceive more situations as threatening and, consequently, to react to more situations with state anxiety than their low-trait-anxious counterparts. Several studies have examined the effects of trait and state anxiety on performance. For example, the results from a study conducted by Weinberg (1979) indicated that low-trait anxious participants performed better than high trait-anxious participants. Much of the recent work on cognitive and somatic state anxiety in sport evolved from Liebert and Morris' (1967) model of test anxiety.

Liebert and Morris (1967) extended the conceptualization of test anxiety in their two-component model comprised of the concepts of worry and emotionality. They defined worry as "cognitive concern about the consequences of failing, the ability of others relative to one's own, etc." and emotionality as "indices of anxiety which are

primarily autonomic" (p. 975). Morris, Davis, and Hutchings (1981) suggested that Liebert and Morris' concepts of worry and emotionality were essentially synonymous with cognitive and somatic anxiety, respectively, key concepts in Davidson and Schwartz's (1976) multidimensional model of anxiety. Davidson and Schwartz (1976) suggested that cognitive anxiety consists of negative thoughts regarding one's performance, which result in decreased concentration. Somatic anxiety, on the other hand, refers to physical symptoms such as increased heart rate, sweating, and nausea.

Martens, Burton, Vealey, Bump, and Smith (1990) sparked interest in this multidimensional theory of anxiety, consisting of cognitive and somatic components, in the sport psychology literature with the development of the Competitive State Anxiety Inventory – 2 (CSAI-2). The CSAI-2 has become the predominant multidimensional anxiety measure utilized by sport psychology researchers. The CSAI-2 consists of separate measures of cognitive and somatic anxiety, in addition to a measure of self-confidence, which emerged during the development of the inventory. Distinguishing between these subcomponents of cognitive and somatic anxiety is critical, because multidimensional anxiety theory suggests that they differentially affect one's performance. Specifically, this theory proposes that cognitive state anxiety has a negative, linear relationship with performance, whereas somatic state anxiety has a curvilinear relationship with performance. In addition, proponents of multidimensional anxiety theory contend that cognitive and somatic anxiety should be examined separately due to their differing antecedents.

Some studies have suggested that both types of anxiety can impair an individual's athletic performance (Burton, 1988; Gould, Petlichkoff, Simons, & Vevera, 1987)

although there is inconsistency regarding which of the two is more influential. For example, Burton (1988) found that cognitive anxiety had a greater negative impact on performance, whereas Gould et al. (1987) suggested that somatic anxiety had a stronger negative relationship. Some investigators have cited methodological weaknesses in measuring variables such as performance to explain discrepancies in results (e.g., Burton, 1988; Jones, 1995). Others have emphasized the importance of examining intra-individual variables, suggesting that researchers should not ignore potential individual differences in cognitive and somatic anxiety (e.g., Smith, 1996).

In addition to investigating the impact of cognitive and somatic anxiety on performance, some investigators chose to examine the antecedents of multidimensional state anxiety (e.g., Hammermeister & Burton, 2001; Roberts, 1986; Smith, 1996). Cognitive appraisal, including perceived threat, has consistently emerged in the literature as an antecedent of multidimensional state anxiety. Hall, Kerr, and Matthews (1998) suggested that "One motivational construct that may have a significant impact upon the cognitive appraisal process and predispose athletes to experience achievement anxiety is perfectionism" (p. 196).

Perfectionism

One dictionary definition of a perfectionist was a "person who demands perfection" (Kidney, 1993, p. 192). This is a relatively simplistic and tautological definition that fails to provide a clear picture of this complex and multifaceted construct. Attempts to further our understanding of perfectionism have resulted in increased attention in the psychological literature over the past few decades. A large portion of that attention has focused on defining the construct. High personal standards consistently

emerges in the literature as a core characteristic of perfectionism. Adler (1956), who defined perfectionism in terms of excessive personal standards, contended that striving for perfection is a normal part of development. Nonetheless, the empirical literature has revealed associations between perfectionism and a number of psychological difficulties, including depression (Hewitt & Dyck, 1986; Hewitt & Flett, 1990), substance abuse (Pacht, 1984), low self-esteem (Preusser, Rice, & Ashby, 1994), and anxiety (Frost et al., 1990; Flett et al., 1989; Hewitt & Flett, 1991b; Saboonchi & Lundh, 1997).

According to the perfectionism literature, there are two distinct models that have received increased attention in the past few years, both emphasizing the multidimensional nature of the construct. The first model is two-dimensional in nature. It is comprised of adaptive and maladaptive perfectionism, also referred to by Hamachek (1978) as normal and neurotic perfectionism. According to Hamachek, normal perfectionists tend to set high, realistic standards, and to focus on their strengths and abilities. They are often motivated by their desire for improvement. Neurotic perfectionists, on the other hand, tend to set unrealistically high standards for themselves and focus on their weaknesses and what they cannot do. Their primary motivation for doing something is fear, specifically, fear of failure. A second model of perfectionism is three-dimensional, consisting of self-oriented, other-oriented, and socially prescribed perfectionism (Hewitt & Flett, 1990, 1991a).

Hewitt and Flett (1991a) identified three dimensions of perfectionism: self-oriented perfectionism, other-oriented perfectionism, and socially prescribed perfectionism. Self-oriented perfectionists are extremely self critical and unable to accept their flaws. Other-oriented perfectionists hold unrealistic standards for their significant

others. Socially prescribed perfectionists believe that other people expect them to be perfect. They feel as though it is impossible to live up to the expectations that are placed on them.

Recently researchers have begun to explore the relationship between perfectionism, anxiety, and athletic performance. Much of the work has drawn upon multidimensional anxiety theory, examining the components of cognitive and somatic anxiety, and to a lesser extent, self-confidence. Research has revealed very interesting relationships between various characteristics of perfectionism and anxiety. Yet there remains to-date little empirical work on the role that perfectionism plays in anxiety, and how that role impacts athletic performance. Questions also remain about multidimensional anxiety theory. Specifically, the question of how cognitive anxiety negatively impacts performance remains unclear. Gould and Krane (1992) hypothesized that cognitive anxiety has a negative impact on performance as a result of a shift in focus from the competition towards task-irrelevant anxiety cognitions. In the test anxiety literature, Wine (1980) hypothesized that high-test anxious individuals shift their focus from the task at-hand to self-preoccupied, task-irrelevant worry cognitions, and Davidson and Schwartz (1976) also suggested that disrupted attention was related to the concept of cognitive anxiety. This remains an area in need of further inquiry in sport psychology, and currently serves as a limitation of the theory (Gould & Krane, 1992). Specifically, what role does attentional distraction play in the relationship between cognitive state anxiety and athletic performance and what is the role of perfectionism in this relationship?

The present study was designed to address questions and limitations of multidimensional anxiety theory. The emphasis is on the cognitive anxiety-performance relationship, and the roles of attentional distraction and perfectionism. The following section provides an in-depth review of the literature pertaining to multidimensional anxiety theory, vis-à-vis the examination of cognitive and somatic anxiety, in addition to perfectionism literature, and the limited amount of empirical work examining perfectionism in sport. At the end of the literature review is a detailed description of the research questions and hypotheses addressed in the present investigation. Following the literature review is a description of the methodology used to answer the research questions, including a discussion of the participants, measures, and procedures. The final two sections include a discussion of the results, followed by an in-depth discussion of those results, including suggestions for future research and implications for practice.

Literature Review

Multidimensional anxiety theory has received increased attention in sport psychology, particularly over the past fifteen years. Building upon its foundation in the general psychological literature, sport psychology researchers attempted to define the components of cognitive and somatic anxiety, and to further conceptualize these concepts as they relate to athletic competition. Investigators have examined several facets of cognitive and somatic anxiety, including their relationship to athletic performance (Burton, 1988; Burton & Naylor, 1997; Gould et al., 1987; Gould, Petlichkoff, & Weinberg, 1984; Krane & Williams, 1987), techniques, such as guided imagery, meditation, self-talk, and physical exercise, to minimize their often debilitating impact on athletic performance (Hanton & Jones, 1999a; Hanton & Jones, 1999b; Schwartz, Davidson, & Goleman, 1978), as well as antecedents of competitive state anxiety (Hall et al., 1998; Hammermeister & Burton, 2001; Roberts, 1986; Smith, 1996). Taken together, results from numerous studies on multidimensional anxiety theory seem to suggest an important contribution of intra-individual variables to athletes' perceptions, experiences, and interpretations of competitive state anxiety. Consequently, investigators have recently begun to examine the relationship between competitive state anxiety and psychological factors, including perfectionism. Few studies to date have examined perfectionism in sport, including potential relationships to cognitive and somatic anxiety. Despite this limited amount of research relating perfectionism to multidimensional anxiety in sport, the few existing studies provide an important contribution to the conceptualization of this complex construct and demonstrate the need for additional research in this area.

Multidimensional Anxiety and Athletic Performance

Initial research on the components of multidimensional anxiety theory attempted to identify not only consequences of cognitive and somatic anxiety on performance, but additional relationships between these components of anxiety as well. Gould et al. (1984) designed two studies to explore the antecedents of (such as years of experience, perceived ability, and previous match outcome), temporal changes in, and relationships between Competitive State Anxiety Inventory-2 (CSAI-2; Martens et al., 1990) subcomponents (i.e. cognitive anxiety, somatic anxiety, and self-confidence). The first study consisted of a sample of 37 wrestlers at the collegiate level. The second study examined 63 high school volleyball players.

Results from their two studies supported those from previous research suggesting that the three subcomponents, cognitive anxiety, somatic anxiety, and self-confidence, are independent. Results also supported previous findings that had suggested that somatic anxiety increases as competition approaches. Cognitive anxiety and self-confidence, on the other hand, remained stable in this study. The authors suggested that cognitive anxiety and self-confidence may remain stable prior to competition because it is believed that they are related to changes in performance expectancies, which do not occur until competition has begun. Additional results from this study found that none of the antecedents, years of experience, perceived ability, and previous match outcome, were strongly related to all three of the subcomponents. Years of experience, for example, was related to cognitive and somatic anxiety but not self-confidence, and perceived ability was strongly related to self-confidence but not cognitive and somatic anxiety.

The authors provided some suggestions for future research in this area. One suggestion was that future research should identify the specific antecedents for each of the three subcomponents. Finally, although results regarding performance were contradictory, there was some, albeit marginal, support for cognitive anxiety as a better predictor of performance than somatic anxiety, with greater levels of cognitive anxiety resulting in poorer athletic performance. In a following study, however, Gould et al. (1987) found some contradictory results, suggesting that cognitive anxiety may not be a more powerful predictor of performance than somatic anxiety.

Due to the inconsistent findings in the literature regarding cognitive and somatic anxiety and their impact on athletic performance, Gould et al. (1987) further examined this relationship. The purpose of their study was to test linear and curvilinear (inverted-U) relationships between sport performance and a multidimensional measure of state anxiety, using the Competitive State Anxiety Inventory-2 (CSAI-2; Martens et al., 1990). The authors suggested that the limited use of standardized assessments to measure performance might contribute to inconsistent results regarding the CSAI-2 performance relationship. To account for this suggested weakness, the authors used pistol shooting as a standardized measure of performance as they examined 39 participants from a Police Training Institute. The researchers hypothesized that cognitive anxiety would have a stronger relationship to performance than somatic anxiety. They also hypothesized that curvilinear, as opposed to linear, functions would better explain the relationships between cognitive and somatic anxiety and performance.

The results did not support the curvilinear hypothesis in relationship to cognitive anxiety and performance, nor did they support the hypothesis that cognitive anxiety

would have a stronger relationship to performance than somatic anxiety. Results did, however, support the curvilinear hypothesis with regard to somatic anxiety, which was also found to have a stronger relationship than cognitive anxiety on performance. To their surprise, researchers also found a negative relationship between self-confidence and performance. These results provide additional support that state anxiety is a multidimensional construct. The authors suggested that the discrepancy between results from this study and those from previous studies regarding the strength of the relationship between cognitive anxiety and performance may lie in the shooting task that was used in this study. The authors suggested that the shooting task was more sensitive to somatic responses. A study by Krane and Williams (1987) provided yet another examination of this relationship, using the CSAI-2 (Martens et al., 1990) with gymnasts and golfers.

Krane and Williams (1987) examined somatic anxiety, cognitive anxiety, and self-confidence among high school gymnasts and golfers at the collegiate level 24 hours prior to competition. They were primarily interested in which of the three subcomponents of the Competitive State Anxiety Inventory-2 (CSAI-2; Martens et al., 1990), somatic anxiety, cognitive anxiety, or self-confidence, would best predict performance. They also examined these variables with respect to the subjective versus objective evaluative nature of the two sports, where gymnastics is subjective and golf is objective.

The results indicated that none of the three components significantly predicted performance for either the golfers or the gymnasts. The researchers also found that the gymnasts (in the subjective sport) exhibited more cognitive anxiety and lower self-confidence than the golfers (in the objective sport). As hypothesized, cognitive anxiety and self-confidence remained stable during the 24 hours prior to the competition for the

athletes, while somatic anxiety increased. However, as the time to compete drew closer, the gymnasts experienced an increase in cognitive anxiety and a decrease in self-confidence. The authors suggested that this might be the result of less experience and skill level exhibited by these gymnasts. They also suggested that additional research might compare athletes with different skill and experience levels, across different sports, in competitions of equal importance (the performance of the golfers in this study was measured in practice while the gymnasts were measured in actual competition). The results from this study, suggesting that neither cognitive nor somatic anxiety significantly predicted performance, are yet another contradiction in the literature. Burton (1988) suggested that the inconsistencies in the literature may be a result of poor instrumentation. He conducted a study to address this issue.

According to Burton (1988) the purpose of his study was to examine the relationship between anxiety and performance, based upon the commonly utilized multidimensional model of anxiety. As a result of increasing criticism in the literature regarding inconsistent results with respect to anxiety and performance-prediction, Burton chose to use improved instrumentation to attempt to address these concerns. He tested three assumptions: (a) cognitive anxiety has a stronger relationship to performance than somatic anxiety, (b) somatic anxiety exhibits an inverted-U relationship with performance and cognitive anxiety exhibits a negative linear relationship, while self-confidence exhibits a positive linear relationship, (c) task duration and complexity would mediate a relationship between somatic anxiety and performance, resulting in a strong relationship for tasks of short duration and high or low complexity.

To test his assumptions, Burton examined swimmers at the collegiate level. Using the improved methodology/assessment of performance (i.e. intra-individual performance measure), the results from this study supported previous results, suggesting that cognitive anxiety had a greater negative impact on performance than somatic anxiety, and therefore was the better predictor of performance. Results also supported the above-mentioned assumptions regarding the inverted-U relationship between somatic anxiety and performance, and the negative and positive linear relationships between cognitive anxiety and self-confidence respectively, and performance. With regard to task complexity and duration, results appeared to support the mediational model, suggesting that task duration and complexity mediates a relationship between somatic anxiety and performance. Burton's results, accounting for previous methodological weaknesses, provided yet additional support for cognitive anxiety as more detrimental to performance than somatic anxiety. In addition to attempting to predict athletic performance, research on anxiety extended to techniques aimed at reducing the deleterious effects on performance.

Techniques to Minimize Debilitating Effects on Performance

Landin and Hebert (1999) examined the effectiveness of the use of self-talk on tennis performance. They also examined the perceptions of the athletes regarding the use of the self-talk strategies and how they felt that it impacted their performance. The researchers taught the collegiate tennis players the self-talk strategies and the players then utilized them in practice. They collected data via questionnaires, interviews, and quantitative assessments. Results suggested that the self-talk strategies that they had taught the tennis players were effective, particularly with regard to movement-related elements of skills. The authors suggested that these results demonstrate effectiveness in

the remediation of movement pattern problems, and thus appear to be effective techniques to enhance performance.

Schwartz et al. (1978) also examined techniques used to minimize detrimental effects of anxiety on performance. They investigated the effectiveness of two types of relaxation procedures (physical exercise and meditation) on different components of anxiety (somatic versus cognitive). Physical exercise was considered a somatic technique and meditation was considered a cognitive technique. The authors developed an anxiety symptom checklist comprised of somatic and cognitive subscales. Their sample size consisted of 77 participants. Demographic information regarding age, gender, and other variables was not provided. The first portion of the study resulted in the development of the Cognitive-Somatic Anxiety Questionnaire (CSAQ). The authors found a moderate correlation ($r = .42$) between the somatic and cognitive scales. Results of this study indicated that those who engaged in physical exercise experienced less somatic, but more cognitive anxiety, and those who meditated experienced less cognitive but more somatic anxiety. It would appear as though both types of relaxation techniques may be necessary to combat the detrimental effects of both somatic and cognitive anxiety on performance.

De Francesco and Burke (1997) expanded the literature pertaining to effective techniques in their investigation of performance enhancement strategies that were utilized most often by professional tennis players in a Lipton Tennis Tournament. Their results indicated that the most utilized strategies included imagery, self-talk, goal-setting, relaxation, and mental preparation. The tennis professionals indicated that they used these strategies before and during, but not necessarily following competition. Higher-ranked players stated that the strategies that they used impacted their performance more than

lower-ranked players, who did not attribute more of their performance to the strategies they used. The investigators suggested that future research should examine differences between novice and elite performers with regard to implementation of performance enhancement strategies.

Hanton and Jones (1999a) focused on interpretations of anxiety as facilitative or debilitative. Specifically, they investigated how athletes who were considered elite performers were able to interpret the anxiety that they experienced prior to competition as facilitative as opposed to debilitative. The researchers used qualitative methodology and interviewed elite male swimmers. The results revealed that the swimmers did not always interpret the anxiety as facilitative. Rather, when they were novices, they interpreted their anxiety as debilitative. Some of their concerns included letting teammates down, making mistakes, concerns about their performance and adequacy of their training. The swimmers stated that through conversations with coaches, parents, peers, and others, they had learned how to use their anxiety in a positive, facilitative manner. Some of the techniques that they used to accomplish this goal included imagery and goal-setting strategies, designed to reduce uncertainty and doubt, characteristics that have been associated with perfectionism (Frost, Marten, Lahart, & Rosenblate, 1990) and have been identified, along with additional variables associated with expectations of success and perceived threat, as antecedents of cognitive anxiety (Hall et al., 1998; Hammermeister & Burton, 2001; Jones, 1995). These characteristics may also be related to attentional distraction.

Hanton and Jones (1999b) designed a second study to use specific techniques in an effort to combat the debilitating effects of anxiety on performance. The purpose of

their study was to test the effectiveness of a multimodal intervention program, consisting of imagery, goal setting, and self-talk, for swimmers who suffered debilitating effects as a result of anxiety. The researchers provided cognitive restructuring interventions for three swimmers, while a fourth was used for the control. The purpose of the intervention was to restructure the debilitating interpretations of the anxiety (somatic and cognitive anxiety, as measured by the CSAI-2; Martens et al., 1990), not to reduce the intensity of the anxiety. As a result, the researchers expected that the intensity levels would remain stable for all four participants. They also expected that the performance of those in the treatment group would be enhanced as a result of the facilitative interpretations via cognitive restructuring.

The researchers found that the intensity levels of anxiety did remain stable for the participants. They also found that, although the levels did not decrease, as the researchers had predicted, the participants in the treatment group did experience more facilitative interpretations of that cognitive and somatic anxiety, which resulted in enhanced performance and increased self-confidence, as predicted. The results from this study suggest that it is not particularly necessary to reduce anxiety, as most treatment methods attempt to do. Rather, these results suggest that cognitive restructuring, through imagery, goal setting, and self-talk, appears to lead to benefits in enhancing performance, as well as assisting the athlete to interpret cognitive and somatic anxiety symptoms as more facilitative as opposed to debilitative (as they are often interpreted by athletes).

Results from these studies examining techniques to reduce the debilitating effects of anxiety suggest that a cognitive component is critical in understanding the cognitive anxiety-performance relationship. The techniques seem to center around reducing, or

eliminating altogether, distracting, negative cognitions. For example, researchers used self-talk strategies in several of the studies, and results supported their effectiveness. Self-talk strategies, in particular, are designed to assist the athlete in regaining focus on the competition, and may simply be targeting, and thus reducing, attentional distraction. Therefore, attentional distraction may be the key variable in the relationship between cognitive anxiety and performance. Researchers examining techniques to reduce the impact of anxiety on performance also alluded to potential antecedents of competitive state anxiety, including characteristics of perfectionism.

Antecedents of Cognitive and Somatic Anxiety

The literature on antecedents of cognitive and somatic anxiety suggests that each has different antecedents (e.g., Gould et al., 1984; Jones, 1995). In addition, Jones, Swain, and Cale (1991) found differences between males and females with respect to predictors of each of these subcomponents of anxiety. They found that variables associated with winning and interpersonal comparison predicted cognitive anxiety for males, whereas variables associated with personal goals and standards predicted cognitive anxiety for females. Recently, Hammermeister and Burton (2001) extended research in this area to reveal additional differences in predicting precompetitive anxiety.

Hammermeister and Burton (2001) were interested in identifying the antecedents of somatic and cognitive anxiety. Lazarus' (1991) stress model, comprised of primary appraisal, secondary appraisal, and coping resources, served as the conceptual framework for their study. They sampled 175 triathletes, 70 cyclists, and 70 distance runners, utilizing five separate instruments, including the CSAI-2 (Martens et al., 1990). Multivariate analyses of variance, conducted to compare high- and low-anxious groups,

revealed significant main effects for perceived threat, perceived control, and coping resources for cognitive anxiety groups, and only significant main effects for perceived threat for somatic anxiety groups. In addition, stepwise multiple regression analyses revealed that perceived threat variables, particularly those associated with "concern about developing an effective race plan and trying to perform up to capabilities" (p. 86) best predicted cognitive anxiety, with coping resources as the second best model, and perceived control as the poorest predictor. These results, coupled with those from other studies revealing individual differences in predicting precompetitive state anxiety, highlight the need for further inquiry.

Hall et al. (1998) pursued this line of research, examining perfectionism as an antecedent of precompetitive anxiety in athletes. They utilized Smith's (1996) conceptual model of sport performance anxiety as the framework for their study. Smith explains multidimensional state anxiety in terms of cognitive appraisal, emphasizing intrapersonal and situational factors, which determine the intensity and duration of multidimensional state anxiety responses. The purpose of their study was "to determine the predictive influence of achievement goals and dimensions of perfectionism on the temporal patterning of state anxiety prior to a competitive sporting event" and "to determine whether the strength of athletes' endorsement of an ego orientation would moderate the influence of individual differences in perfectionism on precompetitive anxiety" (pp. 198-999). Participants in their study consisted of 119 high school student athletes competing in a within-school cross-country meet. Among the instruments that they used were the CSAI-2 (Martens et al., 1990) and the Multidimensional Perfectionism Scale (MPS; Frost, et al., 1990), a measure designed to determine the extent to which individuals

engage in perfectionistic thinking. Athletes completed the CSAI-2 four times: one week, two days, one day, and 30 minutes prior to competition.

Several interesting results emerged with regard to predicting cognitive anxiety, in particular. Overall perfectionism and concern over making mistakes consistently predicted precompetitive cognitive anxiety, with concern over mistakes emerging as the most salient predictor. In addition, doubting one's actions significantly predicted cognitive anxiety immediately preceding performance. These results lend some support to Hall et al.'s hypothesis that neurotic perfectionism would significantly predict cognitive anxiety. Additional research is needed to better conceptualize the role that perfectionism may play in multidimensional anxiety, and cognitive anxiety, in particular.

Perfectionism

Perfectionism, like anxiety, has received considerable attention as a multidimensional construct. Some researchers have identified normal and neurotic dimensions of perfectionism (e.g., Hamachek, 1978), some have viewed perfectionism as three-dimensional (e.g., Hewitt & Flett, 1991a), and others have suggested that it is comprised of six specific characteristics (Frost et al., 1990), which can also be used to distinguish adaptive from maladaptive perfectionists. Perfectionism has been associated with a number of psychological problems, including anxiety. Recently, researchers in perfectionism have extended their work in the general psychological literature into the sport psychology arena, often focusing on relationships between various dimensions of perfectionism and precompetitive anxiety. Despite the recent interest in, and contributions to, the conceptualization of perfectionism in athletes, many questions remain unanswered and in need of investigation.

Multidimensional models of perfectionism. Hewitt and Flett (1991a) conducted five studies in the development of the Multidimensional Perfectionism Scale (HFMPS). They identified, via factor analysis, three dimensions of perfectionism: self-oriented perfectionism, other-oriented perfectionism, and socially prescribed perfectionism. Self-oriented perfectionists attempt to achieve perfection in everything they do. They are predominantly motivated by a fear of failure. They set high, unrealistic personal standards, which they then use to evaluate themselves. Previous research has revealed a relationship between components of self-oriented perfectionism and anxiety. Other-oriented perfectionism is similar to self-oriented perfectionism. The difference lies in the object to whom the perfectionistic expectations are directed. Other-oriented perfectionism is interpersonal in nature. These perfectionists set unrealistic standards for their significant others and then rigorously evaluate them. Socially prescribed perfectionism differs from both other- and self-oriented perfectionism in that the focus lies in the attribution of the expectations of perfection. Socially prescribed perfectionists believe that other people "have unrealistic standards for them, evaluate them stringently, and exert pressure on them to be perfect" (p. 457). They feel as though the expectations that are placed on them are impossible to meet; yet they are often consumed with attempting to meet those expectations.

The investigators conducted five separate studies. Four of the studies were designed to assess the reliability and validity of the HFMPS, and the fifth was designed to assess relationships between the three components of perfectionism, personality disorders, and psychological distress. Results revealed an adequate degree of reliability and validity for the HFMPS. The researchers also found that it is useful with clinical and

subclinical populations. Among the many results that they obtained in the fifth study, Hewitt and Flett found that the largest, positive correlation was between socially prescribed perfectionism and anxiety. The HFMPS has become a popular measure of perfectionism, due, in part, to its solid psychometric properties. In addition to Hewitt and Flett's (1991a) work, others have contributed to current conceptualizations of perfectionism as a multidimensional construct (Frost, Heimberg, Holt, Mattia, & Neubauer, 1993; Hamachek, 1978; Slaney, Ashby, & Trippi, 1995).

Hamachek (1978) distinguished normal (or adaptive) from neurotic (or maladaptive) perfectionism. People who are adaptively perfectionistic tend to set high, realistic standards. They focus on their strengths and abilities, and experience a sense of pleasure and satisfaction with their efforts. Adaptive perfectionists have high self-esteem and are able to celebrate their successes. They can also accommodate to situations that require them to be less precise and "perfect." Adaptive perfectionists are often motivated by their desire for improvement. According to Hamachek, when adaptive perfectionists experience behavioral symptoms such as depression, shame, or guilt, their experiences are less intense and have a shorter duration than maladaptive perfectionists.

Maladaptive perfectionists tend to set unrealistically high standards for themselves and focus on their weaknesses and what they cannot do. Their primary motivation for doing something is fear, specifically, fear of failure. They often experience feelings of inferiority, anxiety, and emotional exhaustion, even before they have begun the task, and often suffer from low self-esteem. Maladaptive perfectionists typically feel as though they are never good enough, which tends to keep them from celebrating successes and accomplishments. They tell themselves that they can and should do better

than they are doing. Some of the behavioral symptoms that they may experience, such as depression, shame, guilt, procrastination, and self-depreciation are fairly intense and can last for extended periods of time. Several studies provide additional evidence of the psychological distress that maladaptive perfectionists often experience (Blatt, 1995; Blatt & Zuroff, 1992; Frost & Marten, 1990; Hewitt & Flett, 1991a; Hewitt & Flett, 1991b). Other researchers have used factor analysis to demonstrate the distinction between adaptive and maladaptive perfectionism (e.g., Frost, Heimberg, Holt, Mattia, & Neubauer, 1993; Rice, Ashby, & Slaney, 1998). In addition, Frost et al. (1998) found that concern over making mistakes, a central component of maladaptive perfectionism, was related to Hewitt and Flett's socially prescribed perfectionism. This characteristic of perfectionism has also been associated with anxiety.

Perfectionism and anxiety. One of the goals of Flett et al.'s (1989) study was to identify a potential relationship between perfectionism and anxiety. They used the Perfectionism Scale (PS) and the State-Trait Anxiety Inventory to measure perfectionism and anxiety, respectively. Based upon their results, self-oriented perfectionism was significantly related to trait anxiety and only marginally related to state anxiety. Results also suggested that life stress, as measured by the Social Readjustment Rating Scale (SRRS), mediates the relationship between self-oriented perfectionism and trait anxiety. The authors suggested that future research should continue to investigate perfectionism and anxiety. Hewitt and Flett (1991b) chose to extend this work in their examination of self-oriented, other-oriented, and socially prescribed perfectionism, and differential effects upon unipolar depression and anxiety.

Drawing upon previous perfectionism and anxiety literature, including Flett et al. (1989), Hewitt and Flett (1991b) hypthothesized a relationship between both self-oriented and socially prescribed perfectionism, and anxiety. Although the primary focus of their study was to examine the differential effects of self-oriented, other-oriented, and socially prescribed perfectionism on depression, they believed that it would be important to examine anxiety as well. They used the HFMPS and the Endler Multidimensional Anxiety Scales-State (EMAS-S) to obtain self-reported measures of perfectionism and anxiety, respectively. Results revealed a significant association between both self-oriented and socially prescribed perfectionism and anxiety. Other proponents of the multidimensional nature of perfectionism have uncovered relationships with anxiety as well.

Frost et al. (1990) were interested in expanding the conceptualization of perfectionism. Their beliefs that perfectionism was a multidimensional construct led them to develop the Multidimensional Perfectionism Scale (FMPS). Factor analysis revealed six subscales: Organization, Personal Standards, Parental Expectations, Parental Criticism, Doubts about Actions, and Concern over Mistakes, which contributed the most variance and appears to be the most salient characteristic of perfectionism. Internal consistency coefficients were good, ranging from .77 to .93, with a total of .90 for the perfectionism scale. Frost et al. (1990) also found evidence of criterion and construct validity with the FMPS. Subscales of the FMPS were related to measures of psychological distress, including obsessive-compulsiveness and depression, as well as other measures of perfectionism, such as Burns' Perfectionism Scale. In addition to

developing the FMPS, Frost et al. conducted studies to examine potential relationships with psychopathological symptoms, including depression, compulsivity, and anxiety.

Seventy-two female undergraduate students completed the FMPS, the Brief Symptom Inventors (BSI), the Depressive Experiences Questionnaire, and the Situational Guilt Scale. The researchers found several interesting relationships, including a significant relationship between anxiety and two of the subscales of the FMPS: concern over mistakes and doubts about actions. Overall perfectionism was also significantly correlated with anxiety. Frost pursued this line of inquiry in the sport psychology arena as well (Frost & Henderson, 1991).

Perfectionism, anxiety, and athletic competition. Few studies to date have examined the impact of perfectionism on athletes. Drawing upon the work of Frost et al. (1990), Frost and Henderson (1991) were interested in athletes' negative reactions to making mistakes during competition, and its relationship to competitive anxiety. They hypothesized that concern with making mistakes and doubts about one's actions would be the most salient characteristics of perfectionism related to the athletes' negative reactions and intrusive thoughts. They based their hypothesis, in part, upon competitive trait anxiety research, which found relationships with fear of failure and evaluation. First, they created a list to identify an athlete's thoughts after she/he makes a mistake in competition. Second, the coaches were asked to complete some questions concerning how their athletes handle pressure and recover from mistakes made during competition.

Forty female athletes, participating in tennis, lacrosse, softball, crew, and track, and five coaches, one from each of the sports, participated in the study. The athletes completed a packet comprised of the following instruments: the Multidimensional

Perfectionism Scale (FMPS), the Sport Competition Anxiety Test (SCAT), the Trait Sport-Confidence Inventory (TSCI), a General Sports Orientation Questionnaire "designed to measure general attitudes toward athletics and athletic competition" (p. 326), the Reaction to Mistakes During Competition Scale (RMDC), the Coaches' Questionnaire, and the Thoughts Before Competition Scale. Researchers discovered several interesting results, including a number of correlations.

Overall perfectionism, doubts about one's actions, and concern with making mistakes were negatively related to self-confidence, as measured by the TSCI. Conversely, those athletes who were high in overall perfectionism and concern over mistakes experienced more anxiety prior to athletic competition than their low-scoring counterparts. Concern over mistakes was also most closely related to negative reactions to mistakes as well as negative thoughts 24 hours prior to competition. Specifically:

> Athletes who scored high in Concern Over Mistakes were more worried about other peoples' reactions to their mistakes and more likely to feel they had let themselves down, to focus their attention on the mistake, to talk to themselves about the mistake, to feel more pressure to make up for the mistake, to have more trouble forgetting about the mistake, and to have more recurring images of the mistake (p. 330).

Results from this study suggest negative psychological consequences for highly perfectionistic athletes, specifically, those who are excessively concerned with making mistakes, but also for those who doubt themselves. Results support Hamachek's (1978) contention that evaluated performance, in this case, athletic competition, is viewed as an

opportunity for failure as opposed to success. Results also appear to reflect what Hamachek referred to as neurotic perfectionism.

Frost and Henderson also found that those athletes with high scores on personal standards reported more positive thoughts about sports. They suggested that this might relate to Hamachek's description of normal perfectionism. Interestingly personal standards also correlated significantly with failure orientation, though less than concern over making mistakes. Results from this study suggest that there are negative as well as positive aspects of possessing high personal standards.

In addition, interesting results emerged with respect to the relationship between perfectionism and negative reactions to mistakes during competition. Frost and Henderson found that the athletes scoring high in parental criticism, concern over mistakes, and doubts about actions did not recover well from the mistakes they made during competition, as evidenced by the coaches' ratings of how the athletes respond to mistakes. Based upon the results that they obtained, they suggested a potential relationship between perfectionism and poor performance following a mistake, hypothesizing that "If they focus their attention on the mistake, have difficulty forgetting about it, and have images of it during the remainder of a contest, they may well be distracted from task-relevant thoughts and their performance may suffer" (p. 333). Others have hypothesized that cognitive anxiety may hinder athletic performance as a result of distracting properties, suggesting that the athlete's attention is drawn away from the performance and competition, to task-irrelevant anxiety cognitions. Based upon these results, it appears as though the distracting properties may actually be related to

perfectionism. Specifically, they may be related to concern over making mistakes and doubting one's actions.

Rationale

Taken together, the results from these studies on cognitive anxiety, performance, and perfectionism suggest some apparent gaps in the literature worthy of pursuit. First, researchers in the general psychology and test anxiety literature argue the importance of disrupted attention in the cognitive anxiety-performance relationship (e.g., Davidson & Schwartz, 1976; Wine, 1980). Gould et al. (1987) suggested that "In essence, students with high cognitive or worry state anxiety suffer performance impairments because their attention is misdirected from task-relevant to task-irrelevant self or social evaluative cues" (p. 34). The specific role of attentional distraction in the cognitive anxiety-performance relationship in sport remains unclear. Gould and Krane (1992) suggested that one limitation to multidimensional anxiety theory is a lack of empirical support confirming that cognitive anxiety has a negative impact on performance due to attentional distraction. It is possible that attentional distraction may mediate the cognitive anxiety-performance relationship. It is also possible that cognitive anxiety and attentional distraction interact to negatively impact performance. Which model is a better predictor remains unclear; clarifying this question will extend multidimensional anxiety theory and assist psychologists who work to enhance the performance of athletes.

In addition, the perfectionism literature seems to suggest a relationship between cognitive anxiety and perfectionism, and perfectionism and athletic performance. The specific nature of these relationships remains unclear as well. According to Hall et al. (1998), overall perfectionism, doubts about actions, and concern over mistakes all relate

to cognitive anxiety. Frost and Henderson (1991) found that certain aspects of perfectionism, concern over mistakes and doubts about actions, impacted the athletes' ability to recover from mistakes made during competition. In addition, Gould et al. (1987) suggested a self- and social-evaluative component of cognitive anxiety, which may relate to self-oriented and socially prescribed perfectionism, respectively. Taken together, the literature seems to suggest the possibility that perfectionism, specifically, those aspects of perfectionism that appear to be maladaptive and related to self- and social-evaluation, may actually mediate the relationship between cognitive anxiety and performance. Due to limited research on perfectionism in sport, and the role of attentional distraction in competitive state anxiety, I proposed three questions for investigation.

Research Questions and Hypotheses

The primary purpose of this investigation was to extend multidimensional anxiety theory by studying competing models of the relationship between attentional distraction, cognitive anxiety, and athletic performance. Therefore, my first research question was: does attentional distraction, defined as task-irrelevant cognitions, mediate a relationship between cognitive anxiety and athletic performance, or does attentional distraction interact with cognitive anxiety to negatively impact athletic performance? Based upon Holmbeck's (1997) description of mediation, I expected higher levels of cognitive anxiety to relate to greater attentional distraction. In addition, I expected attentional distraction to negatively impact performance. Finally, I hypothesized an indirect relationship between cognitive anxiety and performance, mediated by attentional distraction. With respect to the test of moderation, I expected that the moderator, attentional distraction, would interact with the predictor, cognitive anxiety, to impact the

dependent variable, athletic performance. I expected that the greatest negative impact on performance would occur under high levels of cognitive anxiety and high attentional distraction. Conversely, I expected low levels of cognitive anxiety and low attentional distraction to have the least negative impact on performance. I further hypothesized that high cognitive anxiety and low attentional distraction would result in better performance than low cognitive anxiety and high attentional distraction.

A secondary purpose of this investigation was to examine the impact of perfectionism on the cognitive anxiety-performance relationship. Consequently, my second research question was: does perfectionism mediate the relationship between cognitive anxiety and athletic performance? I hypothesized that high levels of cognitive anxiety would relate to perfectionism, which, in turn, would negatively impact athletic performance. I expected perfectionism to mediate the relationship between cognitive anxiety and athletic performance. Specifically, I hypothesized that overall perfectionism, as well as those characteristics associated with maladaptive aspects of perfectionism, such as concern over making mistakes and doubts about one's actions, would mediate the relationship between cognitive anxiety and performance. Furthermore, I expected self-oriented and socially prescribed perfectionism, which reflect self- and social-evaluative components, to mediate the cognitive anxiety-performance relationship.

Finally, I am interested in extending the conceptualization of competitive state anxiety, to include an examination of an individual difference variable, as suggested in the literature (e.g., Edwards & Hardy, 1996). Russell, Marshall, and Cox (1998) found that females scored higher than males on cognitive anxiety, suggesting that gender may impact the anxiety-performance relationship. Therefore, I proposed a final exploratory

question for investigation: does gender moderate the proposed mediated relationship between cognitive anxiety, attentional distraction, and performance?

Methodology

I used a descriptive field design to answer the research questions. One of the major advantages to using this type of design is that it has high external validity. The disadvantage, however, is that external validity is gained at the expense of internal validity. I will begin with a description of the participants that I recruited, followed by a description of the instruments, including sample items. I will then conclude with a discussion of the procedures for the present investigation.

Participants

Based on the number of variables and types of analyses for this study, I needed a minimum of 97 athletes to achieve a statistical power of .80 at a .05 alpha, with a medium effect size (Cohen, 1992). Sixty-one male baseball players and 41 female softball players from five high schools in the West and Midwest regions of the United States participated in the study. The majority of the participants played on the junior varsity team (n = 51, 50%) or the varsity team (n = 37, 36.3%), with 4.9%, 3.9%, 2.9%, and 2.0% playing on the junior varsity and varsity, freshman, freshman and junior varsity, and freshman and varsity teams, respectively.

Participants ranged in age from 14 to 18 years, with an average age of 16.28 years (SD = 1.05). Ninety percent of the athletes were White, European American, 7.8% were Hispanic, Latino, Mexican American, and 1% was Native American or American Indian (one with missing race/ethnicity data). In addition, 9.8% of the participants were freshmen, 46.1% were sophomores, 23.5% were juniors, and 20.6% were seniors. The athletes in the present study ranged in years of playing experience from one to fifteen, with an average of 9.06 years and a standard deviation of 2.87 (two with missing data).

Instrumentation

I used five measures in this investigation to address the proposed research questions. In addition, I collected demographic information (Appendix A) from each participant. First, I measured perfectionism with Hewitt and Flett's (1991) Multidimensional Perfectionism Scale (HFMPS) and the Frost et al. (1990) Multidimensional Perfectionism Scale (FMPS). I used the cognitive anxiety subscale of the Competitive State Anxiety Inventory – 2 (CSAI-2; Martens et al., 1990), a popular inventory in the sport psychology literature, to measure cognitive anxiety. In addition, some people have argued that discrepant results in the competitive state anxiety literature are due to poor performance indicators (e.g., Burton, 1988; Gould et al., 1987; Jones, 1995). They suggest that using variables such as win/loss, or performance times, are "rather global in nature and unlikely to be sufficiently sensitive to detect statistically significant anxiety effects" (Jones, 1995, p. 461). To address these measurement concerns, I used an intra-individual measure of performance, as well as coaches' ratings of each athlete's performance. Finally, I used a modified version of the Cognitive Interference Questionnaire-Sport-Specific Scale (Sarason & Stoops, 1978) to tap attentional distraction.

Multidimensional Perfectionism Scale (HFMPS; Hewitt & Flett, 1991). The HFMPS (Appendix B) is a 45-item inventory designed to assess three dimensions of perfectionism: self-oriented, other-oriented, and socially prescribed perfectionism. Each of the three subscales consists of 15 items. Participants respond to the items using a 7-point likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). Statements reflecting self-oriented perfectionism include "One of my goals is to be perfect in

everything I do." Statements such as "I have high expectations for the people who are important to me" reflect other-oriented perfectionism. Statements including "My family expects me to be perfect" assess socially prescribed perfectionism. The HFMPS has solid reliability, with coefficient alphas of .88 for self-oriented perfectionism, .74 for other-oriented perfectionism, and .81 for socially prescribed perfectionism. I used the self-oriented and socially prescribed perfectionism subscales for the present study.

Furthermore, the HFMPS has demonstrated adequate concurrent validity (Turnbull-Donovan, & Mikail, 1990). Subscales of the HFMPS have correlated significantly with various measures of emotion, personality measures, and performance standards (Hewitt & Flett, 1991a). In addition, two of the subscales, self-oriented and socially prescribed perfectionism, were significantly associated with depression and anxiety, providing additional evidence of the validity of the HFMPS (Hewitt & Flett, 1991b).

Multidimensional Perfectionism Scale (FMPS; Frost et al., 1990). The FMPS (Appendix C) contains 35 self-report items designed to provide an overall perfectionism score as well as scores on six subscales: Concern over Mistakes, Personal Standards, Parental Criticism, Parental Expectations, Doubts about Actions, and Organization. In addition, the FMPS can be used to identify maladaptive and adaptive perfectionism. Participants respond to items on this measure using a 5-point Likert scale ranging from 1 (disagree strongly) to 5 (agree strongly). The Concern over Mistakes subscale consists of nine items designed to tap an individual's negative reactions to making mistakes (e.g., "I should be upset if I make a mistake;" "People will probably think less of me if I make a mistake"). The Personal Standards subscale consists of seven items designed to assess the

importance individuals place on setting high standards with which they use to evaluate themselves (e.g., "I hate being less than the best at things;" "I have extremely high goals"). The Parental Criticism subscale, consisting of four items, reflects the perception of one's parents as overly critical (e.g., "As a child, I was punished for doing things less than perfect;" "I never felt like I could meet my parents' standards"). Individuals' perceptions that their parents set high goals for them are reflected in the Parental Expectations subscale, consisting of five items (e.g., "My parents have expected excellence from me;" "My parents wanted me to be the best at everything"). Doubts about Actions, the fifth subscale, consists of four items that measure the extent to which individuals doubt their abilities (e.g., "Even when I do something very carefully, I often feel that it is not quite right;" "I usually have doubts about the simple everyday things I do"). The final subscale, Organization, is comprised of six items reflecting an individual's attempts to be orderly (e.g., "I try to be an organized person;" "Organization is very important to me"). I used the Concern over Mistakes and Doubts about Actions subscales for the present study, in addition to a total perfectionism score.

The FMPS has adequate reliability, with Cronbach's coefficient alpha ranging from .78 to .92. In addition, the FMPS has yielded strong evidence of construct, concurrent and criterion validity. For example, most of the subscales were positively, significantly related to measures of psychological symptoms such as depression, self-esteem, and compulsiveness, providing evidence of criterion validity (Frost et al., 1990; Frost et al., 1993). Frost et al. (1993) also found evidence of construct validity based on correlations with other perfectionism measures. Furthermore, concurrent validity is

evidenced in correlations with measures such as the Almost Perfect Scale (Frost et al., 1993). The FMPS is a widely utilized measure in the perfectionism literature.

Competitive State Anxiety Inventory–2 (CSAI–2; Martens et al., 1990). The CSAI–2 (Appendix D) consists of three subscales, measuring cognitive anxiety, somatic anxiety, and self-confidence. Each subscale consists of nine items. I only used the cognitive anxiety subscale in the present investigation. Items reflecting cognitive anxiety include: "I am concerned about this competition," "I have self-doubts," and "I'm concerned about reaching my goal." Participants respond to the inventory using a 4-point likert scale, ranging from 1 (not at all) to 4 (very much so). Coefficient alphas for the cognitive anxiety subscale ranged from .79 to .81 across three samples of high school athletes, demonstrating solid internal consistency (Martens et al., 1990). In addition, Martens et al. found evidence of concurrent validity. The CSAI-2 has been used in several studies to measure independent contributions of cognitive and somatic anxiety, and self-confidence (Janelle, Singer, & Williams, 1999).

Intra-individual Performance Measure. Careful examination of game batting average revealed that 45.1% of the participants batted .000, indicating that they did not hit during the game under investigation. Consequently, it appeared that a good performance indicator would be predicting whether an individual got a hit or did not get a hit, controlling for season batting average. This procedure offered a more sensitive measure of performance than solely examining each player's batting average in the single game under investigation.

Coaches' Ratings of Performance. In addition to the intra-individual performance measure, I asked each coach to rate the performance of each athlete during that game.

Coaches used a 7-point Likert scale ranging from 1 = very poor performance to 7 = excellent performance, to determine how the athlete played in the game under investigation, compared to how the athlete typically performed (Appendix E).

Cognitive Interference Questionnaire – Sport-Specific Scale. Schwenkmezger and Laux (1986) modified Sarason's (1978) Cognitive Interference Questionnaire to measure sport-specific task-irrelevant cognitions (attentional distraction). The modification resulted in a ten-item questionnaire (Appendix F). Man, Stuchlikova, and Kindlmann (1995) made minor changes to some of the wording of Schwenkmezger et al.'s measure, to assess task-irrelevant cognitions in soccer players, yet maintained the core of the original ten items. Participants used a 5-point scale, in which 1 = never, 2 = once, 3 = a few times, 4 = often, and 5 = very often, to describe how frequently they experienced each of the ten different thoughts during that competition. The questionnaire consists of items such as "I worried about what my team members and my coach thought of me," and "I compared the performance of my team members to my own performance." Cronbach's coefficient alpha for the questionnaire was .70. Additional psychometric properties were not reported.

For the purposes of the present study, I made minor word changes on two of the items for clarity and to match the sport for which I collected data. For the item which states "I ruminated about previous mistakes," I changed the word "ruminated," which may be unclear to high school students, back to Schwenkmezger et al.'s original wording of the item, "I was concerned about previous mistakes." I then changed the item "I thought about the referee being prejudiced" to "I thought about the umpire favoring the

other team," to better reflect baseball and softball, and to clarify the use of prejudice for my target population.

Procedure

I began by obtaining permission from the athletic directors at each school from which I intended to recruit student athletes. Initially I restricted recruitment to one particular conference in the Midwest. Due to fewer than expected participants I extended recruitment to additional high schools in the Midwest, as well as in the West. Students from a total of five high schools participated in the study. At each school, I began by informing the athletic directors that I was interested in high school student athlete performance enhancement. I further explained that I was conducting a study to examine variables that may negatively impact athletes' performance in competition. I informed them that I needed their athletes to complete a small packet of questionnaires. Each athletic director referred me to the coaches for further approval. I then contacted the freshman, junior varsity, and varsity coaches at each of the five schools who agreed to participate in the study and explained the purpose of my study. I further explained what I would need from each of their athletes who participated in the study as well as from them.

Each coach who agreed to participate first obtained parental consent. Athletes who had received parental consent (see Appendix G for parental consent letter) then provided their assent (see Appendix H for adolescent assent letter) to participate in the study. Those athletes completed the Frost et al. (1990) FMPS and Hewitt and Flett's (1991) HFMPS either after practice or on their way to a game. Participants then completed the CSAI-2 no more than thirty minutes prior to competition. Immediately

following their game, the athletes completed the Cognitive Interference Questionnaire-Sport-Specific Scale and the demographic sheet. Each coach then provided me with their athletes' season batting average, batting average for the game under investigation, and the rating of each player's performance in that game. Each participant received a coupon for a free food item from a fast food chain. In addition, each participant's name was entered into a drawing to win one of four $25.00 cash prizes for participating in the study. I informed parents, coaches, and athletes participating in the study that their participation was strictly voluntary, and there was no penalty, should they choose not to participate. I also told participants that they could withdraw from the study at any time.

Results

Descriptive Statistics and Instrument Reliabilities

I conducted reliability analyses on all measures to assess internal consistency. These results, as well as scale and subscale means and standard deviations, are summarized in Table 1 (Appendix I). All of the scales and subscales, with the exception of the Doubts about Actions subscale of the FMPS (Frost et al., 1990), revealed adequate levels of internal consistency. Other studies have also yielded low reliabilities on the Doubts about Actions subscale, requiring the researchers to eliminate one of the items in order to yield adequate reliability (Hall et al., 1998). Due to the poor internal consistency of the Doubts about Actions subscale, I removed it from further analyses in the present study. Only one other study similar to the present investigation using the CSAI-2 reported descriptive statistics for the Cognitive Anxiety subscale. Hall et al. (1998) found fairly similar results in their descriptive analysis of Cognitive Anxiety ($M = 20.36$, $SD = 6.56$).

Attentional Distraction as a Mediator

I began by testing the first part of the primary question: does attentional distraction, defined as task-irrelevant cognitions, mediate a relationship between cognitive anxiety and athletic performance? I conducted a series of multiple regression analyses following Holmbeck's (1997) suggestions for testing the paths of a mediational model. Three effects must be significant for attentional distraction to be considered a mediator. First, there must be a significant association between cognitive anxiety (the predictor) and attentional distraction (the mediator). Second, cognitive anxiety (the predictor) and performance (the outcome) must be significantly related. Finally, the association between cognitive anxiety and performance should decrease when accounting

for attentional distraction, indicating that attentional distraction mediates the cognitive anxiety-performance relationship. Correlations of the predictor and outcome variables can be found in Table 2 (Appendix J).

I used the categorical measure of performance, getting a hit (dummy-coded 1) or not getting a hit (dummy-coded 0), as the outcome in the first model. To create a more sensitive measure of individual performance, I controlled for season batting average in the first step of each regression analysis. First, I conducted a multiple regression analysis to test the path between cognitive anxiety and attentional distraction. Results revealed no significant association between season batting average and attentional distraction, $R^2 = .00$, $F(1, 99) = .10$, $p > .05$. However, cognitive anxiety was significantly and positively related to attentional distraction, $R^2 = .14$, $F(2, 98) = 7.80$, $p < .01$ (see Table 4, Appendix L, under step 1 for predicting attentional distraction, for relevant regression statistics). Because the dependent variable is categorical, I used logistic regression to test the remaining two paths, again controlling for season average. Results revealed that season batting average significantly predicted whether an individual got a hit or not, $\chi^2_{(1, N = 101)} = 11.31$, $p < .01$. Furthermore, results revealed that cognitive anxiety evidenced a potential trend towards significance, $\chi^2_{(1, N = 101)} = 3.68$, $p = .055$. Because I was interested in whether this relationship decreased after controlling for attentional distraction, I continued to test the model. Adding attentional distraction to the model yielded a significant block chi-square statistic ($\chi^2_{(2, N = 101)} = 6.08$, $p < .05$) and a significant model chi-square statistic ($\chi^2_{(3, N = 101)} = 17.38$, $p < .01$). However, the logistic regression coefficient revealed that attentional distraction was not significantly associated with getting a hit (Table 3, Appendix K, contains the logistic regression coefficients

(β's), standard errors (SE), Wald statistics, and odds ratios). As a result, attentional distraction does not appear to mediate the relationship between cognitive anxiety and getting a hit, despite the fact that the relationship between cognitive anxiety and getting a hit becomes nonsignificant when controlling for attentional distraction ($p = .23$).

I then used coaches' ratings of performance as the outcome in the second model, and continued to control for season batting average in the first step of each regression. Recall that analyses revealed a positive, significant relationship between cognitive anxiety and attentional distraction, controlling for season average, ($R^2 = .14$, $F(2, 98) = 7.80$, $p < .01$). Cognitive anxiety was not significantly related to coaches' ratings, ($R^2 = .02$, $F(2, 95) = 1.18$, $p > .05$), indicating that attentional distraction did not mediate the cognitive anxiety-coaches' ratings relationship. Season batting average was also not significantly associated with coaches' ratings, $R^2 = .00$, $F(1, 96) = .05$, $p > .05$. In order to further understand the relationship between cognitive anxiety, attentional distraction, and coaches' ratings, I completed the test of mediation by simultaneously entering cognitive anxiety and attentional distraction. Results revealed that the once nonsignificant relationship between cognitive anxiety and coaches' ratings becomes significant when controlling for attentional distraction. It appears as though attentional distraction may be suppressing the relationship between cognitive anxiety and coaches' ratings. Inclusion of attentional distraction in the regression equation may have removed unwanted variance in cognitive anxiety, and thus enhanced the relationship between cognitive anxiety and coaches' ratings. In addition, results revealed that attentional distraction significantly, negatively, predicted coaches' ratings (see Table 4 for relevant regression statistics).

Attentional Distraction as a Moderator

Subsequent to the test of mediation, I examined the second part of the primary research question: does attentional distraction interact with cognitive anxiety to negatively impact athletic performance? Following procedures described by Aiken and West (1991), support for a moderator effect will be evident if there is a significant change in variance in the performance outcome (getting a hit or coaches' ratings of performance) accounted for by adding the interaction of the predictor (cognitive anxiety) and the moderator (attentional distraction) to the equation. I began by standardizing scores for the CSAI-2 and the Cognitive Interference Questionnaire-Sport-Specific Scale. In the first set of hierarchical regression equations I used coaches' ratings of performance as the criterion variable. The combination of cognitive anxiety and attentional distraction accounted for significant variation in coaches' ratings, $R^2 = .09$, $F(2, 96) = 4.66$, $p < .05$. The Cognitive Anxiety X Attentional Distraction interaction term did not add significant explained variation in coaches' ratings, $\Delta R^2 = .00$, F change $(1, 95) = .31$, $p > .05$, indicating that attentional distraction does not moderate the cognitive anxiety-coaches' ratings relationship.

I used logistic regression in the second set of analyses, because the criterion variable was categorical (getting a hit or not getting a hit). Season average was controlled for in each analysis. In the first step, I entered the centered values for cognitive anxiety and attentional distraction. The block chi-square statistic was significant ($\chi^2_{(2, N = 101)} = 6.08$, $p < .05$). I then entered the multiplicative interaction term (Cognitive Anxiety X Attentional Distraction). The block chi-square statistic for this analysis was not significant ($\chi^2_{(1, N = 101)} = .22$, $p > .05$), indicating that attentional distraction does not moderate this relationship.

Perfectionism as a Mediator

I then tested the secondary research question: does perfectionism mediate the relationship between cognitive anxiety and athletic performance? Because cognitive anxiety was not significantly associated with coaches' ratings, $R^2 = .02$, $F(2, 95) = 1.18$, $p > .05$, none of the perfectionism dimensions could mediate the cognitive anxiety-coaches' ratings relationship (recall that mediation requires a significant relationship between the predictor and the outcome). Cognitive anxiety did, however, appear to add a potentially significant contribution in predicting whether someone got a hit ($\chi^2_{(1, N = 101)} = 3.68$, $p = .055$). Consequently, I chose to conduct tests of mediation for concern over mistakes and overall perfectionism using the categorical criterion variable of getting a hit or not getting a hit. I did not conduct a full test of mediation for self-oriented or socially prescribed perfectionism due to nonsignificant results in the first step of the multiple regression analyses. Specifically, after controlling for season average, results revealed a nonsignificant relationship between cognitive anxiety and self-oriented perfectionism, $R^2 = .03$, $F(2, 98) = 1.51$, $p > .05$, indicating that self-oriented perfectionism could not mediate the cognitive anxiety-getting a hit relationship. In addition, after controlling for season average results revealed a nonsignificant relationship between cognitive anxiety and socially prescribed perfectionism, $R^2 = .02$, $F(2, 98) = .97$, $p > .05$, indicating that socially prescribed perfectionism could not mediate the relationship between cognitive anxiety and getting a hit or not getting a hit.

I then examined concern over mistakes as the mediator. I used multiple regression to test the path between the continuous variables of cognitive anxiety and concern over mistakes. After controlling for season batting average results revealed a significant,

positive association between cognitive anxiety and concern over mistakes, $R^2 = .14$, $F(2, 98) = 8.23$, $p < .01$. As in prior analyses, the second step of the logistic regression analysis revealed that cognitive anxiety evidenced a potential trend towards significance ($\chi^2_{(1, N = 101)} = 3.68$, $p = .055$). Again, because I was interested in whether this relationship decreased when controlling for concern over mistakes, I continued to test the model. Adding concern over mistakes to the model did result in a decrease in the relationship between cognitive anxiety and getting a hit, $\chi^2_{(2, N = 101)} = 4.31$, $p > .05$). However, concern over mistakes had a Wald statistic of .63, which was not significant at the .05 level. Consequently, concern over mistakes did not mediate the relationship between cognitive anxiety and getting a hit (see Table 5, Appendix M, for the logistic regression coefficients (β's), standard errors (SE), Wald statistics, and odds ratios).

I used the overall perfectionism subscale of the FMPS (Frost et al., 1990) as the mediator in the second model. Once again I used multiple regression to test the first path because overall perfectionism, the criterion in the first analysis, was continuous. After controlling for season batting average, results from the multiple regression analysis revealed a significant, positive relationship between cognitive anxiety and overall perfectionism, $R^2 = .17$, $F(2, 98) = 9.67$, $p < .01$. Recall that results from the logistic regression testing the path between cognitive anxiety and getting a hit revealed a potential trend towards significance, $\chi^2_{(1, N = 101)} = 3.68$, $p = .055$. Therefore, I completed the test of mediation. Further logistic regression analyses revealed that adding overall perfectionism to the model resulted in a decrease in cognitive anxiety's ability to predict getting a hit, $\chi^2 = 3.81$, $p > .05$. However, overall perfectionism had a Wald statistic of .13 that was not significant at the .05 level, indicating that overall perfectionism did not

mediate the relationship between cognitive anxiety and getting a hit (see Table 6, Appendix N, for the logistic regression coefficients (β's), standard errors (SE), Wald statistics, and odds ratios).

Exploratory Analyses

In the final set of analyses I examined attentional distraction as a mediator between the cognitive anxiety-performance relationship, by gender. The first model that I tested, for females, used getting a hit or not getting a hit as the criterion. I began by testing the path between cognitive anxiety and attentional distraction using multiple regression, because the criterion in this first analysis was continuous. After controlling for season batting average, results revealed a nonsignficant relationship between cognitive anxiety and attentional distraction, $R^2 = .12$, $F(2, 37) = 2.61$, $p > .05$. Because mediation requires a significant relationship between the predictor and mediator, this first step revealed that attentional distraction could not mediate the relationship between cognitive anxiety and getting a hit for females. Therefore, it was not necessary to complete the test of mediation. In addition, because the first step remains the same when testing attentional distraction as a mediator in the cognitive anxiety-coaches' ratings of performance relationship for females, the nonsignificant relationship between cognitive anxiety and attentional distraction indicated that attentional distraction could not mediate the relationship between cognitive anxiety and coaches' ratings. Therefore, it was not necessary to complete the test of mediation for this model as well.

Results for the males in the present study were slightly different. I began by testing the path between cognitive anxiety and attentional distraction, controlling for season batting average. Results from the first multiple regression revealed a significant,

positive relationship between cognitive anxiety and attentional distraction, $R^2 = .15$, $F(2, 58) = 5.00$, $p < .05$. In the second step I used logistic regression to test the path between cognitive anxiety and getting a hit, still controlling for season average. Results revealed that season average did not significantly predict if males in this study would get a hit, $\chi^2 = 3.14$, $p > .05$. In addition, results revealed that cognitive anxiety did not significantly predict if males would get a hit, $\chi^2 = 3.27$, $p > .05$. Consequently, it was not necessary to complete the final step in the test of mediation because the nonsignificant results from the second step indicated that attentional distraction did not mediate the relationship between cognitive anxiety and getting a hit.

The second model that I tested for males examined coaches' ratings of performance as the criterion. Results from step one, the path between cognitive anxiety and attentional distraction, controlling for season batting average, remained the same as in the previous analysis; cognitive anxiety was significantly, positively associated with attentional distraction, $R^2 = .15$, $F(2, 58) = 5.00$, $p < .05$. However, as with the previous model, step two yielded a nonsignificant relationship between cognitive anxiety and the criterion, (coaches' ratings of performance in the present model), $R^2 = .02$, $F(2, 58) = .48$, $p > .05$. In addition, season average did not predict coaches' ratings of performance, $R^2 = .01$, $F(1, 59) = .85$, $p > .05$. Again, it was not necessary to complete the test of mediation because the nonsignificant results indicated that attentional distraction did not mediate the relationship between cognitive anxiety and coaches' ratings of performance for males in the present study.

Discussion

Multidimensional anxiety theory suggests that cognitive anxiety negatively impacts performance via attentional distraction, indicating a potential mediation effect (Gould & Krane, 1992). Additional literature suggests that cognitive anxiety has a negative, linear relationship with performance (e.g., Burton, 1988). Furthermore, the perfectionism literature appears to suggest a potential relationship between cognitive anxiety and perfectionism, and perfectionism and athletic performance (e.g., Frost and Henderson, 1991). To test these associations in the present study, a sample of high school baseball and softball players completed measures of cognitive anxiety, attentional distraction, and perfectionism. Although some of the results were unexpected based upon the literature, the present study contributes to current conceptualizations of cognitive anxiety, attentional distraction, and perfectionism in sport.

Attentional Distraction as a Mediator

Initial regression analyses revealed an unexpected nonsignificant relationship between cognitive anxiety and coaches' ratings of performance, and only a potential trend towards significance between cognitive anxiety and getting a hit. Multidimensional anxiety theory states that cognitive anxiety negatively impacts performance and there is a great deal of empirical support for this hypothesis, although there are some exceptions. Other studies of high school student athletes also found that cognitive anxiety did not significantly predict performance (e.g., Krane & Williams, 1987). It is possible that there is something unique about how high school student athletes experience cognitive anxiety that serves as a buffer to their performance. For example, it is possible that variables such as maturity may interact with cognitive anxiety to better predict performance at this age.

In addition, research has indicated that adolescents are motivated to participate in sports for reasons such as affiliation, to be a part of a group, and to have fun (e.g., Weiss & Chaumeton, 1992). Competition at the collegiate level tends to be far more competitive and athletes often participate in athletics at the collegiate level for reasons that extend beyond affiliation. For example, in their study of sport motivation at the collegiate level, Martindale, Devlin, and Vyse (1990) found that achievement, improvement, and health and fitness were the top reasons college athletes gave for participating in sport. As a result, cognitive anxiety may be a more powerful predictor of performance for athletes at the collegiate level as opposed to those at the high school level. Although high school student athletes may experience cognitive anxiety prior to performance, the difference in motivational patterns, combined with the difference in competitive climate for high school and college athletes, may differentially impact the cognitive anxiety-performance relationship for each group. Future research should examine these variables for athletes at the collegiate and high school level.

In addition, the cognitive anxiety-performance relationship in the present study may have been impacted by the intensity of the competition. Several coaches informed me that they had played teams that were not challenging to their players the day they completed the questionnaires. As a result, although the high school student athletes may have experienced cognitive anxiety prior to competition, something may have occurred during the competition to eliminate or reduce the anxiety. It is possible that the anxiety that they had experienced prior to competition, which may be a typical reaction for these athletes regardless of the skill level of their opponents, may have diminished during the actual competition. For example, when the athletes who had experienced cognitive

anxiety prior to competition realized that the opponents did not pose a threat, the previously felt anxiety may have diminished or may have been eliminated altogether, resulting in a failure to adequately predict its impact on performance. Future research should examine cognitive anxiety prior to, as well as during, competition to determine whether athletes continue to experience cognitive anxiety during the competition. Future research should also consider examining intensity and difficulty of the competition as potential moderators in the cognitive anxiety-performance relationship.

It is also possible that the number of years of experience may have impacted the athletes' interpretation of their cognitive anxiety. Athletes in the present study ranged in years of playing experience from one to fifteen, with a mean of nine years. Hanton and Jones (1999a) found that swimmers with more experience had learned to interpret their anxiety as facilitative as opposed to debilitative. The more experienced athletes in the present study may have experienced cognitive anxiety prior to competition, yet they may have interpreted that anxiety in a facilitative manner. The present study did not examine how participants interpreted their anxiety. Future research should examine variables that may lead athletes to interpret their cognitive anxiety as facilitating as opposed to debilitating, which may impact the relationship between cognitive anxiety and performance.

Analyses of the test of mediation between cognitive anxiety and getting a hit also revealed an interesting relationship between cognitive anxiety and attentional distraction. Results indicated that cognitive anxiety was significantly, positively associated with attentional distraction, suggesting that increased cognitive anxiety may lead to increased attentional distraction. However, due to the inability to determine causality, it is equally

plausible that increased attentional distraction may lead to increased cognitive anxiety. Additional analyses revealed that season batting average significantly predicted whether a player got a hit and cognitive anxiety appeared to contribute potential significance to the model. Although these results should be interpreted with caution it appears as though increases in cognitive anxiety resulted in a higher probability that players would not get a hit. Conversely, decreases in cognitive anxiety appear to result in an increase in the probability of getting a hit.

The final step in testing the present model yielded a nonsignificant relationship between attentional distraction and getting a hit. One potential explanation for this nonsignificant result may lie in the criterion variable. It is highly probable that participants revealed task irrelevant cognitions that they had experienced throughout the game. As a result, it is unclear whether they actually experienced attentional distraction while at-bat. The self-reported attentional distraction may have occurred while in the outfield/infield, or in the dugout, for example. Future research should consider asking participants to respond to the attentional distraction measure as it pertains to task-irrelevant cognitions they experienced while at-bat. Future research might also consider replicating the present study with other sports. In addition, results revealed a considerable decrease in the relationship between cognitive anxiety and getting a hit after controlling for attentional distraction. Therefore, it is possible that attentional distraction may indeed play a role in cognitive anxiety's ability to predict whether a player gets a hit, albeit not as a mediator.

Interesting results emerged from the test of attentional distraction as a mediator in the cognitive anxiety-coaches' ratings of performance relationship as well. Although the

nonsignificant relationship between cognitive anxiety and coaches' ratings indicated that the present model was not one of mediation, attentional distraction appeared to play a noteworthy role nonetheless. Results revealed a significant, positive relationship between cognitive anxiety and attentional distraction in the first regression equation. Completing the test of mediation revealed a potential suppression effect; after entering cognitive anxiety and attentional distraction simultaneously, the once nonsignificant relationship between cognitive anxiety and coaches' ratings became significant. In the present model, because cognitive anxiety and attentional distraction are significantly, positively related, their true relationships with coaches' ratings may be concealed. Therefore, by including attentional distraction in the equation, the unwanted variance in cognitive anxiety is removed, and its association with coaches' ratings becomes enhanced.

Furthermore, attentional distraction significantly, negatively predicted coaches' ratings of performance. Consequently it appears as though increased levels of attentional distraction result in lower ratings of players' performances by their coaches. However, due to the inability to predict cause and effect the converse may be equally plausible and decreased levels of attentional distraction may lead to higher ratings by coaches. Note that it is possible that the differences revealed in the relationship between attentional distraction and each of the performance indicators (getting a hit/not getting a hit and coaches' ratings) may have occurred because of the differences in the criterion variables themselves. Getting a hit/not getting a hit restricts the measure of performance to batting performance only. However, the coaches rated each player's performance overall, and not just each individual's batting performance. Therefore, coaches' ratings may have been a more sensitive measure of overall performance, reflecting attentional distraction that may

have impacted players at times throughout the game, but not necessarily when they were at-bat. Taken together, the results suggest a more indirect model, where cognitive anxiety predicts attentional distraction, and attentional distraction predicts coaches' ratings, providing some support for multidimensional anxiety theory (Gould & Krane, 1992).

Attentional Distraction as a Moderator

The second model tested included attentional distraction as a moderator in the cognitive anxiety-performance relationship. Results of the test of moderation revealed that attentional distraction did not moderate the relationship between cognitive anxiety and getting a hit, nor between cognitive anxiety and coaches' ratings of performance. Specifically, in the present study cognitive anxiety and attentional distraction did not interact to predict performance. This suggests that the strength of the cognitive anxiety-performance relationship does not appear to weaken as the athletes' attentional distraction decreases. Furthermore, a combination of high levels of cognitive anxiety and high levels of attentional distraction does not appear to predict performance. Initially these results were surprising. However, in light of the results obtained when testing the mediational model, the role of attentional distraction in the cognitive anxiety-performance relationship became somewhat more defined.

Initial results revealed that attentional distraction appears to suppress the relationship between cognitive anxiety and coaches' ratings of performance, suggesting that there are some irrelevant elements in cognitive anxiety that become partialled out when attentional distraction is added to the regression equation. This results in a more purified predictor (cognitive anxiety) and, consequently, increased predictive power (Maassen & Bakker, 2001). It is possible that the shared irrelevant elements between

cognitive anxiety and attentional distraction impacted the results in the test of moderation as well, resulting in impure predictors and decreased predictive power when entered into the regression equations as an interaction.

Perfectionism as a Mediator

Because cognitive anxiety was not significantly related to coaches' ratings, it was not possible to accurately test a mediation model of the cognitive anxiety-coaches' ratings relationship using any of the dimensions of perfectionism as potential mediators. However, because cognitive anxiety evidenced a potential trend towards significance, I conducted logistic regression analyses to explore concern over mistakes and overall perfectionism as potential mediators of the cognitive anxiety-getting a hit relationship. Self-oriented and socially prescribed perfectionism did not relate significantly to cognitive anxiety and were therefore not analyzed further. Results revealed a significant, positive relationship between cognitive anxiety and concern about making mistakes, and between cognitive anxiety and overall perfectionism. Based upon these results increased levels of cognitive anxiety may lead to increased concern about making mistakes. Conversely, increased concern about making mistakes may result in increased levels of cognitive anxiety. However, neither concern over mistakes nor overall perfectionism significantly predicted getting a hit. Consequently, cognitive anxiety does not appear to impact whether a player gets a hit solely through excessive concern about making mistakes or overall perfectionism, despite the considerable decrease in cognitive anxiety's ability to predict getting a hit after controlling for concern over mistakes and overall perfectionism in each model, respectively. One potential explanation for the nonsignificant relationship between concern about making mistakes and getting a hit is

that the Concern over Mistakes subscale of the FMPS (Frost et al., 1990) measures a propensity toward being concerned about making mistakes and did not measure if participants actually experienced excessive concern about making mistakes during the game under investigation, specifically. Like attentinonal distraction, future research should examine whether any of the dimensions of perfectionism positively or negatively impact other areas of performance, in baseball and softball as well as other sports.

At this time it is still unclear what role perfectionism may play in predicting athletic performance. Although results from the present study suggest that concern about making mistakes and overall perfectionism did not predict whether a player got a hit, it is possible that these dimensions, as well as other more maladaptive aspects of perfectionism, may negatively impact other indices of performance, perhaps in other sports. Frost and Henderson (1990) suggested that maladaptive aspects of perfectionism, such as concern over making mistakes and doubting one's actions, divert the athlete's attention away from the competition and toward irrelevant thoughts, resulting in poor performance. Therefore, it is plausible that these maladaptive aspects of perfectionism may negatively impact performance, even though concern over mistakes did not mediate the relationship between cognitive anxiety and performance in the present study.

In light of the distracting nature of some of the characteristics of perfectionism described by Frost and Henderson (1990), it is possible that maladaptive perfectionism may have a negative impact on performance via attentional distraction. Future research should explore this possibility in order to further our understanding of the impact that perfectionism may have on athletic performance. If evaluated performance, such as athletic competition, is viewed as an opportunity to fail rather than succeed, as Hamachek

(1978) proposed, then it is critical to understand how this may impact an athlete during competition. In addition, although I did not examine a potential interactive effect between any of the dimensions of perfectionism and cognitive anxiety, it is also possible that those characteristics associated with more maladaptive aspects of perfectionism might interact with cognitive anxiety to negatively impact performance. Future research should examine this possibility, as it would add increased understanding of the cognitive anxiety-performance relationship.

Exploratory Analyses

Some researchers have suggested examining individual difference variables such as gender in studies on competitive state anxiety. As a result, I conducted exploratory gender analyses to determine whether gender moderated the proposed mediated relationship between cognitive anxiety, attentional distraction, and performance. Results revealed that attentional distraction did not mediate the relationship between cognitive anxiety and either performance indicator for females or males. However, cognitive anxiety was significantly, positively related to attentional distraction for males, though not for females. It appears as though cognitive anxiety predicts attentional distraction only for the males in the present study.

Limitations and Future Research

One limitation of the present study may have been the outcome measures. Although it was important to utilize an intra-individual measure of performance, such as the one that I used in this study, the sole objective measure of performance examined only one aspect of a baseball or softball player's performance in that competition – batting performance. It would be important to replicate this study using athletes in sports

other than softball or baseball to determine whether or not the results are unique to these sports. I used coaches' ratings to provide a better picture of overall performance in the competition. However, their ratings were a subjective measure (although it is important to note that coaches' ratings were significantly correlated with game average). It may be helpful to utilize a more objective measure of athletes' overall performance in future studies, such as overall game statistics.

It is important to point out that coaches' ratings, the overall measure of performance, provided results that were closest to those predicted. Therefore, a more objective measure of overall performance may provide an even better understanding of the relationship between cognitive anxiety, attentional distraction, and performance, as well as the role of perfectionism in the cognitive anxiety-performance relationship. In addition, future research might consider replicating this study with college student baseball and softball players to see if the results are consistent at different levels. Future research might also consider using a larger sample. The sample for the present study consisted of 102 high school students, which exceeded the number required for statistical power. However, it is possible that a larger sample, including a larger sample of female players, would yield different results.

Another limitation of the present study is that I did not use random samples. Consequently, results should be interpreted with caution, as they may not reflect the entire population of high school baseball and softball players. In addition, the majority of the data were gathered from one region, further impacting generalizability. Finally, although I initially attempted to gather data from only one athletic conference, I was unable to do so. It is possible that the difference in conferences may have impacted the

results as well. Some of the conferences may have been more competitive than others, for example.

Implications for Practice

Many of the results from the present study must be interpreted with caution and should be replicated. However, it appears as though attentional distraction may be a salient variable in predicting athletic performance. In addition, cognitive anxiety appears to predict attentional distraction, which appears to predict coaches' ratings of overall performance, with increased attentional distraction resulting in lower ratings of performance, and decreased attentional distraction resulting in higher ratings of performance. Therefore, it is important to help athletes to identify when their attention is diverted from the competition to task-irrelevant cognitions and provide them with the tools to reduce, if not eliminate, the distraction. Research has shown that self-talk strategies tend to be highly effective with athletes, in addition to cognitive restructuring and thought-stopping techniques (e.g., Landin & Hebert, 1999). Athletes should utilize these strategies to regain their focus on the competition whenever they find themselves focusing on competition-irrelevant cognitions. Reducing attentional distraction is important for maintaining focus and may lead to better performance. Future research should further examine this relationship and the impact of techniques designed to reduce attentional distraction.

It is clear from the present study that attentional distraction is critical to consider when attempting to improve athletic performance. Additionally, given the positive relationship between cognitive anxiety and perfectionism, it is clear that certain characteristics of perfectionism, including overall perfectionism, impact high school

student athletes. What remains less clear is the specific role that perfectionism may play in the cognitive anxiety-performance relationship, which warrants additional research. Future research should consider attentional distraction and perfectionism, specifically maladaptive aspects of perfectionism such as excessive concern over making mistakes and doubts about one's actions (which was not included in analyses in the present study due to low reliability), as important variables that impact athletes.

APPENDICES

APPENDIX A

Demographic Information

1. Please put an "X" next to your gender:

_____Male

_____Female

2. How old are you: _____years

3. Please put an "X" next to your race/ethnicity

_____Black, African-American

_____Asian or Asian-American

_____Hispanic, Latino, Mexican-American

_____Pacific Islander

_____Native American or American Indian

_____White, European American

_____Multicultural Mixed Race

_____Other. (Please explain:_____)

4. Please put an "X" next to your year in school:

_____Freshman _____Junior

_____Sophomore _____Senior

5. Please indicate how long you have been playing baseball/softball: _____

6. Please put an "X" next to the baseball/softball team(s) you play on:

_____Freshman _____Varsity _____Freshman and Varsity

_____J. V. _____Freshman and J.V. _____J.V. and Varsity

_____Other (Please explain:_____)

7. Please indicate if you have been diagnosed with ADD/ADHD: _____yes _____no

APPENDIX B

Multidimensional Perfectionism Scale (HFMPS; Hewitt and Flett, 1991)

Listed below are a number of statements concerning personal characteristics and traits. Read each item and decide whether you agree or disagree and to what extent. In the space next to the statement, mark "1" if you strongly disagree, mark "7" if you strongly agree. If you feel somewhere in between, mark any one of the numbers between 1 and 7; if you feel neutral or undecided, mark the midpoint, "4".

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7

_____ 1. When I am working on something, I cannot relax until it is perfect.
_____ 2. I am not likely to criticize someone for giving up too easily.
_____ 3. It is not important that the people I am close to are successful.
_____ 4. I seldom criticize my friends for accepting second best.
_____ 5. I find it difficult to meet others' expectations of me.
_____ 6. One of my goals is to be perfect in everything I do.
_____ 7. Everything that others do must be of top-notch quality.
_____ 8. I never aim for perfection in my work.
_____ 9. Those around me readily accept that I can make mistakes too.
_____ 10. It doesn't matter when someone close to me does not do their absolute best.
_____ 11. The better I do, the better I am expected to do.
_____ 12. I seldom feel the need to be perfect.
_____ 13. Anything I do that is less than excellent will be seen as poor work by those around me.
_____ 14. I strive to be as perfect as I can be.
_____ 15. It is very important that I am perfect in everything I attempt.
_____ 16. I have very high expectations for the people who are important to me.
_____ 17. I strive to be the best at everything I do.
_____ 18. The people around me expect me to succeed at everything I do.
_____ 19. I do not have very high standards for those around me.
_____ 20. I demand nothing less than perfection of myself.
_____ 21. Others will like me even if I don't excel at everything.
_____ 22. I can't be bothered with people who won't strive to better themselves.
_____ 23. It makes me uneasy to see an error in my work.
_____ 24. I do not expect a lot from my friends.
_____ 25. Success means that I must work even harder to please others.
_____ 26. If I ask someone to do something, I expect it to be done flawlessly.
_____ 27. I cannot stand to see people close to me make mistakes.
_____ 28. I am perfectionistic in setting my goals.
_____ 29. The people who matter to me should never let me down.
_____ 30. Others think I am okay, even when I do not succeed.
_____ 31. I feel that people are too demanding of me.
_____ 32. I must work to my full potential at all time.

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7

_____ 33. Although they may not show it, other people get very upset with me when I slip up.
_____ 34. I do not have to be the best at whatever I am doing.
_____ 35. My family expects me to be perfect.
_____ 36. I do not have very high goals for myself.
_____ 37. My parents rarely expected me to excel in all aspects of my life.
_____ 38. I respect people who are average.
_____ 39. People expect nothing less than perfection from me.
_____ 40. I set very high standards for myself.
_____ 41. People expect more from me than I am capable of giving.
_____ 42. I must always be successful at school or work.
_____ 43. It does not matter to me when a close friend does not try their hardest.
_____ 44. People around me think I am still competent even if I make a mistake.
_____ 45. I seldom expect others to excel at whatever they do.

APPENDIX C

Multidimensional Perfectionism Scale (FMPS; Frost et al., 1990)

Listed below are several statements. In the space next to the statement, please enter a number from "1" (disagree strongly) to "5" (agree strongly) to what degree you agree with each statement.

Disagree Strongly	Disagree	Neutral	Agree	Agree Strongly
1	2	3	4	5

_____ 1. My parents set very high standards for me.
_____ 2. Organization is very important to me.
_____ 3. As a child, I was punished for doing things less than perfect.
_____ 4. If I do not set the highest standards for myself, I am likely to end up as a second-rate person.
_____ 5. My parents never tried to understand my mistakes.
_____ 6. It is important to me that I be thoroughly competent in everything I do.
_____ 7. I am a neat person.
_____ 8. I try to be an organized person.
_____ 9. If I should fail at work/school, I am a failure as a person.
_____ 10. I should be upset if I make a mistake.
_____ 11. My parents wanted me to be the best at everything.
_____ 12. I set higher goals than most people.
_____ 13. If someone does a task at work/school better than I, then I feel like I failed the whole task.
_____ 14. If I fail partly, it is as bad as being a complete failure.
_____ 15. Only outstanding performance is good enough in my family.
_____ 16. I am very good at focusing my efforts on attaining a goal.
_____ 17. Even when I do something very carefully, I often feel that it is not quite right.
_____ 18. I hate being less than the best at things.
_____ 19. I have extremely high goals.
_____ 20. My parents have expected excellence from me.
_____ 21. People will probably think less of me if I make a mistake.
_____ 22. I never felt like I could meet my parents' expectations.
_____ 23. If I do not do as well as other people, it means I am an inferior human being.
_____ 24. Other people seem to accept lower standards from themselves than I do.
_____ 25. If I do not do well all the time, people will not respect me.
_____ 26. My parents have always had higher expectations for my future than I have.
_____ 27. I try to be a neat person.
_____ 28. I usually have doubts about the simple everyday things I do.
_____ 29. Neatness is very important to me.
_____ 30. I expect higher performance in my daily tasks than most people.
_____ 31. I am an organized person.
_____ 32. I tend to get behind in my work because I repeat things over and over.
_____ 33. It takes me a long time to do something "right."
_____ 34. The fewer mistakes I make, the more people will like me.

_____ 35. I never felt like I could meet my parents' standards.

APPENDIX D

Competitive State Anxiety Inventory-2 (CSAI-2; Martens et al., 1990)

A number of statements that athletes have used to describe their feelings before competition are given below. Read each statement and then write the appropriate number to the left of the statement to indicate how you feel right now – at this moment. There are no right or wrong answers. Do not spend too much time on any one statement, but choose the answer which describes your feelings right now.

1 = Not At All
2 = Somewhat
3 = Moderately So
4 = Very Much So

_____ 1. I am concerned about this competition.
_____ 2. I have self-doubts.
_____ 3. I am concerned that I may not do as well in this competition as I could.
_____ 4. I am concerned about losing.
_____ 5. I am concerned about choking under pressure.
_____ 6. I'm concerned about performing poorly.
_____ 7. I'm concerned about reaching my goal.
_____ 8. I'm concerned that others will be disappointed with my performance.
_____ 9. I'm concerned I won't be able to concentrate.

APPENDIX E

Coaches' Rating Scale

Please circle the number that corresponds to your rating of the athlete's performance in today's game, in comparison to how that athlete typically performs:

Name of the athlete: _____

1	2	3	4	5	6	7
Very poor Performance			Average Performance			Excellent Performance

APPENDIX F

Cognitive Interference Questionnaire – Sport-Specific Scale (Schwenkmezger and Laux, 1986)

I am interested in the kinds of thoughts that go through peoples' heads while they are in competition. The following list includes some thoughts you might have had during the game you just finished. Please indicate approximately how often each thought occurred to you during this competition by placing the appropriate number in the blank provided to the left of each question.

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

_____ 1. I worried about what my team members and my coach thought of me.
_____ 2. I thought about my performance.
_____ 3. I thought about things unrelated to the game.
_____ 4. I thought about my losing out on things.
_____ 5. I thought about my bad performance.
_____ 6. I thought about my failure to follow the coach's commands.
_____ 7. I thought about the umpire favoring the other team.
_____ 8. I was concerned about previous mistakes.
_____ 9. I thought about the opposing team giving us a hard time.
_____ 10. I compared the performance of my team members to my own performance.

APPENDIX G

Parental Consent Letter

Dear Parents:

Your daughter/son is being asked to participate in a study about athletic performance enhancement. The purpose of the study is to look at the types of things that affect athletic performance. Should you agree to allow your daughter/son to participate in the study, she/he will be asked to complete two questionnaires before, during, or after a practice. These questionnaires ask your daughter/son to describe such things as her/his standards, expectations, and thoughts about her/his abilities. They take approximately twenty or thirty minutes to complete. Then, on a game day, she/he will complete one questionnaire just before competition begins, and two additional questionnaires just after the game ends. The questionnaire that will be completed just before the competition takes approximately five minutes and asks your daughter/son to describe her/his feelings about the game that is about to begin. One of the questionnaires that she/he will complete after the game takes approximately three minutes and asks your daughter/son to identify thoughts that she/he may have had during the game, and how many times those thoughts occurred. The final questionnaire asks some general information about your daughter/son such as year in school, team that she/he plays on, age, etc. Your adolescent will complete these questionnaires with other teammates who have agreed to participate in the study. Participation should not interfere with your daughter/son's competition. I will also obtain statistics regarding each participant's performance in that game, as well as statistics pertaining to each participant's overall performance during the season at the time of participation in this study, from your daughter/son's coach. Coaches will also provide a rating of your adolescent's performance during the game that day.

Your daughter/son's participation in this study is strictly voluntary. She/he may refuse to participate or discontinue participation at any time without penalty or loss of benefit to which she/he is otherwise entitled. Your daughter/son's confidentiality will be protected to the maximum extent allowable by law. No names will be used on the questionnaires. Your daughter/son's name will be entered into a drawing to win one of four $25.00 cash prizes for participating in this study. Each participant will also receive a discount coupon from a local merchant.

Please feel free to contact me at 517-393-3623, or email me at castroje@msu.edu, if you have any questions or concerns about this study. You may also contact Dr. Ashir Kumar, 517-355-2180, the chairperson of the Michigan State University Committee on Research Involving Human Subjects, if you have additional questions regarding your daughter/son's rights as a participant in this study.

Please consider this letter as informed consent. If you believe that you have been informed about your daughter/son's participation in this study, and you agree to allow her/him to participate, please print and sign your name below and return the signed copy of this letter to your daughter/son's coach within **3 days**. I will be happy to share general results of this study with you upon completion of the project if you are interested in them. In addition, general results will be made available to your son/daughter and his/her coaches upon request. I will not be conducting individual analyses, so I will only be able

to share general results, not individual results about your son/daughter, specifically. Thank you for your participation.

Sincerely,

Jennifer R. Castro, M.S.
Doctoral Candidate

Kenneth G. Rice, Ph.D.
Associate Professor

If you have read the above information and agree to allow your daughter/son to participate in this study, please sign your name below. Please return to her/his coach within 3 days.

_____
(Print Your Name)

_____
(Print Your Daughter/Son's Name)

_____
(Sign Your Name)

_____
(Date Signed)

APPENDIX H

Adolescent Assent Letter

Dear Student Athlete:

You are being asked to participate in a research study to look at things that affect a person's performance on the field. You are asked to complete two questionnaires before, during, or after practice. Then, on one of your game days you will fill out one questionnaire just before your game begins and two right after your game ends. The questions ask you to describe things like your feelings about the upcoming game, thoughts that you had during the game, and your feelings about such things as making mistakes, your abilities, and expectations you have of yourself. The first two questionnaires will take you about twenty or thirty minutes to finish. The one that you fill out just before the game will take about five minutes and the two right after the game take about five-to-seven minutes total to complete. Your coach will also provide some statistics about your performance after the game.

You will complete the questionnaires with your fellow teammates who also agree to participate in the study. You can choose not to participate, or to stop participating at any time without any penalty. Your answers to the questionnaires will be kept private, and I will not share them with anyone. Your name will be entered into a drawing to win one of four $25.00 cash prizes for your participation in this study. You will also receive a discount coupon from a local merchant for your participation.

Please feel free to contact me at 517-393-3623, or email me at castroje@msu.edu, if you have any questions or concerns about this study. You may also contact Dr. Ashir Kumar, 517-355-2180, the chairperson of the Michigan State University Committee on Research Involving Human Subjects, if you have additional questions regarding your rights as a participant in this study.

Please consider this letter as informed consent. If you believe that you have been informed about your participation in this study, and you agree to participate, please print and sign your name below. I will be happy to share general results of this study with you upon completion of the project if you are interested in them. In addition, general results will be made available to your parents and coaches upon request. I will not be conducting individual analyses, so I will only be able to share general results, not individual results about you, specifically. Thank you for your participation.

If you agree to participate in this study, please print and sign your name below.

Sincerely,

Jennifer R. Castro, M.S.
Doctoral Candidate

Kenneth G. Rice, Ph.D.
Associate Professor

(Print Your Name) (Date Signed)

(Sign Your Name)

APPENDIX I

Table 1 Descriptive Statistics and Instrument Reliabilities

Table 1 Descriptive Statistics and Instrument Reliabilities

Instrument	M	SD	α
FMPS (Frost et al., 1990)			
Concern over Mistakes	23.44	6.25	.80
Doubts about Actions	10.89	2.86	.55
Total Perfectionism	83.48	13.82	.85
HFMPS (Hewitt & Flett, 1991)			
Self-oriented Perfectionism	76.18	13.46	.86
Socially Prescribed Perfectionism	56.78	10.93	.73
Cognitive Anxiety Subscale of the CSAI–2	19.06	5.24	.79
Cognitive Interference Questionnaire – Sport-Specific Scale	24.04	6.57	.75

APPENDIX J

Table 2 Correlations of Criterion and Predictor Variables

Table 2 Correlations of Criterion and Predictor Variables

	SA	GH	CR	CA	AD	CM	OP	SOP
GH	.33**							
CR	-.02	.23*						
CA	-.09	-.21*	.15					
AD	.03	-.18	-.19	.37**				
CM	-.09	-.16	.02	.37**	.32**			
OP	.03	-.09	-.06	.40**	.29**	.80**		
SOP	-.06	.03	.04	.17	.12	.34**	.33**	
SPP	-.11	-.10	-.02	.10	.11	.54**	.58**	.22*

*p < .05; **p < .01.

Note: SA = Season Average; GH = Getting a Hit (coded 1); CR = Coaches' Ratings of Performance; CA = Cognitive Anxiety; AD = Attentional Distraction; CM = Concern over Mistakes; OP = Overall Perfectionism; SOP = Self-oriented Perfectionism; SPP = Socially Prescribed Perfectionism

APPENDIX K

Table 3 Logistic Regression Analysis of Attentional Distraction as a Mediator of the Cognitive Anxiety-Getting a Hit Relationship

Table 3 Logistic Regression Analysis of Attentional Distraction as a Mediator of the Cognitive Anxiety-Getting a Hit Relationship

Variables Entered	β	SE_β	Wald	p	Odds Ratio	95% CI (odds)
Step 1						
Season Average	5.51	1.76	9.79	.00	247.83	7.84 to 7831.50
Step 2						
Season Average	5.47	1.81	9.16	.00	237.18	6.88 to 8182.51
Cognitive Anxiety	-.08	.04	3.53	.06	.92	.851 to 1.00
Step 3						
Season Average	5.88	1.88	9.76	.00	358.36	8.95 to 14344.57
Cognitive Anxiety	-.06	.05	1.46	.23	.95	.87 to 1.04
Attentional Distraction	-.06	.04	2.32	.13	.95	.88 to 1.02

APPENDIX L

Table 4 Regression Analyses of Attentional Distraction as a Mediator of the Cognitive Anxiety-Coaches' Ratings of Performance Relationship

Table 4 Regression Analyses of Attentional Distraction as a Mediator of the Cognitive Anxiety-Coaches' Ratings of Performance Relationship

	B	SE B	β
Step 1 (Predicting Attentional Distraction)			
Season Average	1.7	5.02	.03
Cognitive Anxiety	.47	.12	.37**
Step 2 (Predicting Coaches' Ratings)			
Season Average	-.25	1.07	-.02
Cognitive Anxiety	.04	.03	.15
Step 3 (Predicting Coaches' Ratings			
Season Average	-.25	1.07	-.02
Cognitive Anxiety	.07	.03	*.25**
Attentional Distraction	-.06	.02	*-.27***

*p < .05; **p < .01.

APPENDIX M

Table 5 Logistic Regression Analysis of Concern over Mistakes as a Mediator of the Cognitive Anxiety-Getting a Hit Relationship

Table 5 Logistic Regression Analysis of Concern over Mistakes as a Mediator of the Cognitive Anxiety-Getting a Hit Relationship

Variables Entered	β	SE_β	Wald	p	Odds Ratio	95% CI (odds)
Step 1						
Season Average	5.51	1.76	9.79	.00	247.83	7.84 to 7831.50
Step 2						
Season Average	5.47	1.81	9.16	.00	237.18	6.88 to 8182.51
Cognitive Anxiety	-.08	.04	3.53	.06	.92	.851 to 1.00
Step 3						
Season Average	5.44	1.81	9.00	.00	230.97	6.61 to 8072.93
Cognitive Anxiety	-.07	.05	2.15	.14	.94	.86 to 1.02
Concern over Mistakes	-.03	.04	.63	.43	.97	.90 to 1.04

APPENDIX N

Table 6 Logistic Regression Analysis of Overall Perfectionism as a Mediator of the Cognitive Anxiety-Getting a Hit Relationship

Table 6 Logistic Regression Analysis of Overall Perfectionism as a Mediator of the Cognitive Anxiety-Getting a Hit Relationship

Variables Entered	β	SE_β	Wald	p	Odds Ratio	95% CI (odds)
Step 1						
Season Average	5.51	1.76	9.79	.00	247.83	7.84 to 7831.50
Step 2						
Season Average	5.47	1.81	9.16	.00	237.18	6.88 to 8182.51
Cognitive Anxiety	-.08	.04	3.53	.06	.92	.851 to 1.00
Step 3						
Season Average	5.52	1.81	9.27	.00	248.84	7.14 to 8672.25
Cognitive Anxiety	-.07	.05	2.51	.11	.93	.85 to 1.02
Overall Perfectionism	-.01	.02	.13	.72	.99	.96 to 1.03

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