THE EFFECTS OF ANXIETY ON THE PERFORMANCE OF COLLEGIATE GOLFERS IN COMPETITIVE AND NON-COMPETITIVE SITUATIONS

THESIS

Presented to the Graduate Council of the North Texas State University in Partial Fulfillment of the Requirements

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MASTER OF SCIENCE

By

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The purposes of the study were to provide additional information concerning the relationship of Competition Trait Anxiety, State Anxiety, and Performance in collegiate golfers under non-competitive and competitive field settings.

Subjects were thirty college males. Data were analyzed by a three-way analysis of variance with repeated measures. Conclusions of the investigation were: (1) low-Competition-Trait-Anxious golfers performed better and exhibited lower levels of state anxiety than high-and moderate-Competitive-Trait-Anxious golfers in competitive and non-competitive settings; (2) collegiate golfers exhibit higher levels of state anxiety in competitive versus practice settings; and (3) there was a significant relationship between SCAT and pre-competitive state anxiety.
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CHAPTER I

INTRODUCTION

The effects of anxiety on motor performance have been a topic of interest to both coaches and sports psychologists, resulting in a large amount of literature in this area. Both practitioners and researchers (Fiske & Maddi, 1961; Klavora, 1975; Lowe, 1973; Martens, 1970, 1974, 1977; Oxendine, 1976; Spielberger, 1966, 1971, 1972; Weinberg, 1977, 1978) have argued that anxiety plays an important part in an individual's ability to cope with competitive situations and the resultant performances. However, Martens (1971, 1974) notes that the studies investigating the anxiety-motor relationship have led to ambiguous results. In order to obtain a better understanding of the effects of anxiety on motor performance it is first necessary to review the theories which have attempted to explain this relationship.

One of the major theories which has attempted to predict the relationship between anxiety and motor performance is drive theory. The basic prediction of drive theory for the performance of complex skills has been put forth by Spence and Spence (1966). Simply stated, drive theory predicts that Performance = 
Habit X Drive. The concept of drive is based on the assumption that habit hierarchies for motor responses on different motor tasks are clearly determined. Martens (1977) views this as a problem in drive theory research, since it is almost impossible to predict the dominant response.

The other major theory predicting the anxiety-motor relationship is known as the Inverted-U Hypothesis. This hypothesis states that increases in arousal are associated with increases in the quality of performance up to a certain point, after which additional increases in arousal result in decreased performance (Yerkes & Dodson, 1908). There has been considerable evidence to support this hypothesis (Broen & Storms, 1961; Courts, 1942; Duffy, 1962; Lazarus, Deese, & Osler, 1952; Spence & Spence, 1966; Yerkes & Dodson, 1908). However, there are some problems with this theory because much of the evidence reported comes indirectly from testing drive theory. Other difficulties in testing this theory have been inadequate manipulation of arousal in laboratory settings and the inability to precisely measure points along the arousal continuum. Martens (1977) concludes that instead of trying to prove or disprove the Inverted-U, it is probably
better to determine under what situations it is applicable.

To better understand the anxiety-motor relationship it is necessary to use sport-specific anxiety tests. Spielberger (1971) states that "in general, situation-specific trait anxiety (A-Trait) measures are better predictors of elevations in state anxiety (A-State) for a particular class of stress situations than are general A-Trait measures" (p. 490). Martens suggests that better understanding of anxiety would be obtained by looking at specific types of anxiety such as Competition Trait Anxiety. Consequently, Martens (1977) developed the Sport Competition Anxiety Test (SCAT) to provide an instrument for measuring competitive A-Trait in sport-specific situations. In addition, SCAT can be used to predict precompetitive state anxiety.

Another way in which greater understanding of the anxiety-motor relationship can be obtained is through the use of field studies. Much of the previous research in this area has been laboratory-based, and thus it is possible that past researchers have been unable to create the high levels of anxiety typical of competitive sport situations. In addition, since most previous studies have been conducted in the
laboratory, there is virtually no research investigating typical sport skills. Thus, this study investigated the effects of anxiety on golf performance in a field setting.

Statement of the Problem

This study was designed to measure the relationship between state anxiety, competitive trait anxiety, and golf performance in competitive and non-competitive settings.

Hypotheses

The following hypotheses have been investigated:

1. Low-competitive-trait-anxious golfers will perform better than moderate- and high-anxious golfers in competition;

2. Moderate-competitive-trait-anxious golfers will perform better than high-competitive-trait-anxious golfers in competition;

3. High-competitive-trait-anxious golfers will exhibit higher levels of precompetitive state anxiety than low- and moderate-competitive-trait-anxious golfers;

4. Moderate-competitive-trait-anxious golfers will exhibit higher levels of precompetitive state anxiety than low-competitive-trait-anxious golfers;
5. High-, moderate-, and low-competitive-trait-anxious golfers will exhibit no difference in state anxiety before performing in a non-competitive setting.

Definition of Terms

The following terms and definitions were used in this study:

**Trait Anxiety (A-Trait).**—"A personality motive or acquired behavioral disposition that predisposes an individual to perceive a wide range of objectively non-dangerous circumstances as threatening and to respond to these with state-anxiety reaction disproportionate in intensity to the magnitude of the objective danger" (Spielberger, 1966, p. 16).

**State Anxiety (A-State).**—"Refers to the emotional reaction or response that is evoked in an individual who perceives a particular situation as personally dangerous or frightening for him, irrespective of the presence or absence of a real (objective) danger" (Spielberger, 1966, p. 17).

**Arousal**—A state of the organism varying on a continuum from deep sleep to intense excitement (Martens, 1977, p. 17).

**Stress.**—A (perceived) substantial imbalance between demand and response capability, under conditions where
failure to meet demand has important (perceived) consequences (McGrath, 1970, p. 20).

**Competition Trait Anxiety (CTA).** A tendency to perceive competitive situations as threatening and to respond to these situations with feelings of apprehension or tension (Martens, 1977, p. 23).

**Round of golf.** Eighteen holes of regulation play.

**Limitations of the Study**

The study was limited to the use of collegiate golfers from the states of Louisiana, Texas, Michigan, and Oklahoma. Situations were taken from a three-day tournament conducted at the Denton Country Club in Denton, Texas, in September, 1979. There were 12 teams competing.

**Probable Values of the Study**

The principal value of the study was to provide additional information concerning the relationship of competition trait anxiety, state anxiety, and performance of golfers under stressful and non-stressful conditions.
CHAPTER II

REVIEW OF LITERATURE

Over the years, coaches and physical educators have recognized anxiety as an important factor in motor performance. This belief in anxiety as a mediator of performance has also generated much research in sport psychology literature (Carron, 1971; Cattell, 1957; Duffy, 1962; Lazarus, Deese & Osler, 1952; Malmo, 1959; Martens, 1970, 1974, 1976, 1977; McGrath, 1970; Oxendine, 1976; Sarason, 1960; Scanlan, 1975; Spence & Spence, 1966; Spielberger, 1966, 1971, 1972; Weinberg, 1977, 1978). However, the anxiety-motor relationship has proved to be very complicated. This review will investigate the major theories attempting to explain the relationship between motor performance and offering some suggestions for future research.

Drive Theory

One theory which has been used extensively to predict the relationship between anxiety and motor performance is drive theory. The drive theory hypothesis is based on the premise that drive and arousal are synonymous, or that drive is a source of arousal. When drive is defined as having specific
goals, but is not equated with this definition of arousal. However, when drive is viewed as a general state with no specific function, it is synonymous with arousal (Martens, 1977). Therefore, arousal and generalized drive refer to the intensity dimension of behavior (Duffy, 1957; Malmo, 1959). Spence and Spence (1966) have extended drive theory to complex motor skills with the basic prediction being Performance = Habit X Drive. Habit refers to the dominance of correct or incorrect responses during the learning of motor skills. Dominant responses are likely to be incorrect responses during a novel or complex task, but, when a skill is simple or well learned, the dominant response is considered to be correct. Therefore, increased drive or arousal will impair performance in early learning of complex skills and enhance performance in well-learned and simple tasks. When the dominant response is correct, arousal and performance have a positive linear response. When the dominant response is incorrect, drive theory predictions are clouded. However, Martens (1974) states that "when the dominant response is incorrect, it is unlikely that arousal and performance have a negative linear relationship" (p. 21).
Spielberger (1971) states that drive theory begins with two assumptions: first, "noxious and aversive stimuli arouse a hypothetical emotional response; second, drive level is a function of the strength of the emotional response" (p. 267). Spielberger extends drive theory by proposing a State-Trait theory of anxiety, which states that "on simple tasks, in which correct responses are stronger than error tendencies, high A-state would be expected to facilitate performance. On complex or difficult tasks, in which error tendencies are stronger than correct responses, it would be anticipated that high A-state would interfere with performance" (1971, p. 279). Thus task complexity must be taken into account as a critical variable in deriving predictions from drive theory.

An example of research in this area was conducted by Carron (1971), who proposed that the effects of drive on learning and performance be examined as a function of individual differences in ability. He observed that "differences in A-state should have differential effects on performance for subjects who differ in ability. Subjects with high trait anxiety appear to interpret circumstances in which their personal adequacy is evaluated as more threatening
than do low A-trait subjects. Situations characterized by physical threat are not interpreted as differentially threatening by high and low A-trait" (p. 182). Carron's results showed that a difficult task requiring complex motor skills tended to cause high levels of state anxiety in most high-trait-anxious subjects.

Martens (1971) undertook a comprehensive review of the literature testing the drive theory and its relevance to motor performance. In this review, 28 tests were made by comparing high and low groups by the Manifest Anxiety Scale (MAS) in the absence of a stressor on several different motor tasks. A typical study by Farber and Spence (1953) had 40 low-anxious and 40 high-anxious subjects perform on a stylus maze task. As was hypothesized, the maze performance of the high-anxious subjects was poorer than that of the low-anxious subjects. Some other studies have supported the drive-theory hypothesis (Castaneda, Palermo, & McCandless, 1956; Duthies & Roberts, 1968; Hammes & Wiggens, 1962; Martens & Landers, 1970). However, many other studies did not support the drive-theory hypothesis, or found no difference (Axelrod, Cowen, & Heilizer, 1956; Farber & Spence, 1956; Carder, 1965; Carron, 1968; Kanin & Clark, 1957; Matarazzo, 1956; McGuigan, Calvin &

In these studies, trait anxiety scales were used as a method of varying anxiety in order to test drive theory. These inventories assume that individuals high in trait anxiety automatically exhibit higher state anxiety than low-anxious subjects. The literature generally disagrees with this interpretation in the absence of a stressor (Spielberger, 1966; Spence & Spence, 1966). According to Spielberger (1966, 1971), the individual with high trait anxiety reacts with greater levels of state anxiety when confronted with a stressor. The person does not show consistently higher levels of state anxiety at all times and all situations. Spielberger's (1966) trait-state theory interprets trait anxiety as a disposition which is manifested by situational stressors. This could explain why Martens found no changes in performance in the absence of a stressor. However, in studies using a stressor, ambiguous results were found. Some studies reported positive effects (Carron & Moford, 1968; Castaneda, 1956; Ryna & Lakie, 1956), although the majority failed to produce clear support for the situational position of drive theory (Baker, 1961; Diehl, 1965; Farber & Spence, 1956; Hammes &

In addition to the above inconsistent results there are a couple of methodological problems in interpreting drive theory results. First, the absence of clearly determined habit hierarchies for motor responses on various motor tasks makes it impossible to predict clearly whether the correct or incorrect response is dominant. Therefore, it is not possible to test the equation Performance = Habit X Drive.

It has been assumed that when a skill is being learned and the learning curve has not reached an asymptote, the incorrect response is dominant. After the learning curve reaches an asymptote, the correct response is assumed dominant. Since this assumption is crude at best, and because of wide individual and group variation in the development of habit hierarchies, Martens (1974) concludes that "drive theory remains operationally non-function for complex motor behavior" (p. 30). The second major problem results from the failure to verify changes in arousal through subjective reporting or physiological indicants. In the absence of corroborative evidence as to the affectiveness of the stressor, when negative findings are obtained, it is
impossible to determine whether performance was unaffected by changes in arousal, or whether arousal was not effectively changed (Martens, 1974). Finally, drive theory is not intuitively appealing. Its prediction that increasing levels of arousal during a correct dominant response aids performance seems illogical during extreme arousal levels. It would seem obvious that there is some point where further increases in arousal would have negative effects on motor performance. In conclusion, Bolles (1967) states that "the worst failure of the drive concept continues to be that it does not help us to explain behavior" (p. 329).

Inverted-U Hypothesis

The other major theory which has attempted to predict the relationship between arousal and motor performance is known as the Inverted-U Hypothesis. According to Martens (1970), the Inverted-U Hypothesis simply states that "increases in arousal are associated with concomitant increases in the quality of performance up to a certain point, after which additional increases in arousal result in increasingly inferior performance. The level of arousal which stimulates optimal performance lies somewhere in the middle range of the arousal continuum" (p. 29).
Intuitively, the Inverted-U Hypothesis has received a great deal of support in the motor performance area. However, there are only a few studies concerning motor performance which have used designs that could properly test the Inverted-U Hypothesis. Many of these studies were set up to test drive theory predictions, but when drive theory predictions were not supported, the Inverted-U Hypothesis was proposed as a post-hoc explanation. Martens (1975) declares that at least three distinct points on the arousal curve need to be manipulated to provide direct support for the Inverted-U theory.

There have been some studies that have varied three or more levels of anxiety in testing the Inverted-U Hypothesis. Yerkes and Dodson (1908) were the first to show experimental support, by using mice as subjects. Using weak, medium, and strong electric shock, they set out to determine which stimulus was the most conducive to the acquisition of learning or performance. Results showed that all mice who trained under the weak or strong stimulus learned more slowly than those trained under the medium strength stimulus. Martens and Landers (1970) tested the Inverted-U theory using over 1,000 junior high school boys who were given the children's
form of the Manifest Anxiety Scale. The motor task involved the tracking of a ring along a tube which it encircled without making contact. Subjects were either low, medium, or high in trait anxiety and were subjected to one of three levels of psychological stress. In the low-stress condition every care was taken by the experimenter to make the subject feel at ease. In the moderate-stress condition, emphasis was placed on performing well, with subjects being threatened with shock for poor performance. The high-stress condition also involved threat of shock, but, to increase the level of anxiety, the experimenter wore a white coat and was introduced as a doctor. In addition, the pain of shock was suggested to be severe. Heart rates, palmar sweat prints, and questionnaires provided corroborative support for the manipulation of arousal. In addition, Martens and Landers found typically U-shaped performance curves for stress and trait anxiety.

Shore (1958) used 300 students and tested on visual recognition (standard photographic resolution targets). While the task remained constant, the conditions were varied systematically by induction of muscular tension through a pull on a dynamometer. The MAS was used to estimate differences in trait
anxiety. Results indicated that subjects with median MAS scores showed a rise in efficiency to an optimal level, then moved to a gradual decline. Stennet (1957) offered support for the Inverted-U in a study in which Palmar Sweat Index and electromyographic (EMG) recordings were taken during an auditory tracking task under different conditions of incentive. The hypothesis was supported, whether palmar conductance level or the EMG response of any of four different muscle groups was used as the criterion of arousal. Weinberg and Ragan (1978) subjected high-, low-, and moderate-trait-anxiety groups to three levels of psychological stress. Subjects threw tennis balls at a target, and performance results dictated an Inverted-U curve for the three levels of stress, with subjects in the moderate stress condition displaying the highest performance. In addition, results indicated that high-trait-anxious subjects performed best in the low-stress condition, while low-trait-anxious subjects performed best in the high-stress condition. Finally, Matarazzo, Utlett, and Saslow (1955) and Singh (1968), using a motor maze and mirror tracking task, found that moderate-trait-anxiety subjects performed better than high- and low-trait-anxiety subjects.
One of the limitations of the previous studies is the weak manipulation of arousal, since all the studies were conducted in a laboratory setting. However, a number of field studies recently have been conducted which alleviate the problem. For example, Ahart (1973) reported some indication that free-throw shooting performance was related to score differential at the time the shots were taken. The results indicated support for the Inverted-U, as shooting percentages were greater when the score differential was moderate and less when the score was close or when the differential was great. Ahart postulated that moderate arousal increases the shooter's attention to the task, resulting in enhanced performance.

In another field study by Lowe (1973), using Little League baseball players, hitting performances in critical situations were compared. For example, a game was more critical if two teams were playing for first place, as compared to playing for last place. In addition, games became more critical toward the end of the season, as compared to those at the beginning of the season. The criticality of the situation increased as the score became closer, as the game progressed, and as more men were on base. Lowe's results showed support for the Inverted-U Hypothesis,
with Little Leaguers performing better at moderate levels of arousal than at high or low levels. However, Lowe felt that the results were confounded because the task became more difficult as the situation became more critical. To offset this, Lowe computed an index of task difficulty and re-analyzed the data, adjusting for the factor. These new results suggested that the relation between arousal and motor performance was a positive linear one.

In two field experiments (Fenz & Epstein, 1967; Fenz & Jones, 1972), parachutists were monitored throughout a sequence of events leading to a jump, and changes were noted in physiological and cognitive responses which were directly related to experience and mastery of skill. It was found that all jumpers showed a steady increase in arousal as the jump neared. In addition, jumpers recorded a reduction in arousal several minutes before a technically good jump was performed. However, when the jump was rated poor, the arousal level had not been reduced to the moderate level immediately before the jump, but remained quite high. Fenz concluded that moderate levels of arousal are far better for superior jumping than high levels.

Thus, the Inverted-U theory appears to provide a reasonably good explanation for some sport performances,
but several difficulties arise. First, much of the evidence gathered supporting the Inverted-U Hypothesis comes from studies testing drive theory. These studies have only indirectly tested the Inverted-U relationship, since only low- and high-trait-anxious were tested, with no intermediate group. The second problem in testing the Inverted-U Hypothesis is the inability to measure precisely points along the arousal continuum. It is not possible to know whether arousal is manipulated on both sides of the inflection point of the Inverted-U performance curve. Arousal levels are considered too low if the quality of performance increases with increasing levels of arousal, and also if higher levels of arousal still fail to obtain performance decrements. This makes it quite difficult to make predictions, because of the failure to know where the individual is starting or ending on the curve. It is also difficult to disprove the Inverted-U Hypothesis, because it is impossible to determine when the optimum level has been reached. Therefore, Martens (1974) concludes that researchers should not attempt to prove or disprove the Inverted-U Hypothesis, but rather determine under what conditions it is applicable.

The preceding review paints a dark picture of the anxiety-motor relationship, but some new developments
offer encouragement for future research. One of the problems in testing the anxiety-motor relationship stems from the general nature of the trait-anxiety tests employed. However, Martens (1977) has recently established the Sport Competition Anxiety Test (SCAT), which is designed to predict precompetitive state anxiety. Martens (1977) defines competitive trait anxiety as a "tendency to perceive certain competitive situations as threatening and to respond to these situations with feelings of apprehension or tension" (p. 31). He reports that competitive trait anxiety has the following basic factors: first, "the recognition that situation-specific trait-anxiety instruments have superior predictive power when compared to general A-Trait instruments; secondly, the trait-state theory of anxiety which makes the distinction between A-Trait and A-State; thirdly, the development of a conceptual model for the study of competition as a social process" (p. 24).

The following studies present support for SCAT from both experimental laboratory studies and field studies. Scanlan (1976) conducted an experimental study using predetermined success and failure. A total of 306 ten- to twelve-year-old males were given SCAT and divided into high- and low-competitive-trait
groups. These subjects were randomly assigned to one of three manipulated success-failure groups: (a) win 80% of the contests $W_{80}$; (b) win 50% of the contests $W_{50}$; and (c) win 20% of the contests $W_{20}$. The subjects performed on a motor maze, and, as was expected, the $W_{20}$ group manifested greater increases than did $W_{50}$ subjects, who in turn manifested significantly greater increases in state anxiety than the $W_{80}$ subjects. $W_{80}$ subjects showed no increase in state anxiety. Results indicated SCAT to be an accurate predictor of state anxiety, with increasing failure producing concomitant increases in state anxiety.

To determine external validity, several field studies were employed. Martens and Simon (1976) investigated the relationship between SCAT and state anxiety in competitive and non-competitive situations among female interscholastic basketball players. The SAI and SCAT were administered to the teams the evening before the tournament (non-competitive). A precompetitive state anxiety measure was obtained at courtside immediately prior to a game on the first and second days of the tournament. Results indicated that state anxiety increased substantially from basal state (non-competitive) to the precompetitive state. Evidence
from the basketball sample using the **SAI** yielded the strongest support for the **SCAT** as a valid predictor of precompetitive state anxiety.

Another development which should help clear up the anxiety-motor literature has been the development of the State Anxiety Inventory (**SAI**) (Spielberger, 1970). Spielberger (1966) reported that state anxiety "refers to the emotional reaction or response that is evoked in an individual who perceives a particular situation as personally dangerous or frightening for him, irrespective of the presence or absence of a real (objective) danger" (p. 17). Research supporting the validity of the **SAI** is presented in the following studies. Hodges (1967) found that state anxiety scores of undergraduate students at Vanderbilt University increased from a rest period to stress period for subjects exposed to two different stress conditions, failure-threat and shock-threat. In the failure-threat condition, in which each subject was told he was not performing as well as most others, Hodges found that the magnitude of change in state anxiety scores was greater for subjects with high levels of trait anxiety (as measured by the **MAS**) than for low-trait-anxiety subjects. In contrast, for subjects in the shock-threat condition
who were told they had done well but would receive several "strong but safe" electric shocks (no shock was given), increases in state anxiety were unrelated to trait anxiety. In another study, Sachs and Diesenhaus (1969) investigated the effects of examination stress on scores on the SAI scales of undergraduate college students at the University of Illinois. The SAI was administered to these students during a regular class period at the beginning of the summer term (non-stress condition), and subsequently readministered immediately prior to the final examination for the course (stress condition). The mean state-anxiety score in the stress condition was significantly higher than the mean for the non-stress condition. There was also a small but significant decrease in trait-anxiety scores from the first to the second administration of the scale; this the authors interpreted as a general tendency for subjects to obtain lower scores on repeated administrations of personality tests.

Research dealing with the role of arousal in competitive gross motor sport activities is sparse. Some studies have attempted to determine the level of arousal associated with participants in different sports without determining the relationship between
that level and subsequent performance. Without adequate research relating arousal to specific sports skills, suggestions as to the most appropriate level for different sports activities are speculative.

Along these lines (Oxendine (1976), has constructed a table of selected sport skills and matched each of them with a numerical optimum arousal level. Skills were placed on a scale at a point reflecting the needed ingredients for excellent performance. Those activities high on speed, strength, or endurance needs but low on complexity, fine muscle control, and judgment are placed (on a scale from 1-5) nearer to 5. Those activities placing high priority on fine muscle control and coordinated movements but low on strength and speed are placed nearer to 1. This scale is given in Table 1.

<table>
<thead>
<tr>
<th>Level of Arousal</th>
<th>Sports Skills</th>
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| # 5 (Extremely Excited) | Football Blocking  
|                   | Weight Lifting                          |
| #4               | Running Long Jump  
|                   | Swimming Races                          |
| #3               | Basketball Skills  
|                   | Most Gymnastics Skills                   |
| #2               | Tennis  
|                   | Football Quarterback                    |
| #1 (Slight Arousal) | Golf Putting and Short Irons  
|                   | Archery and Bowling                     |
| #0 (Normal State) |                                        |
One of the few studies testing these postulations was conducted by Klavora (1975). Subjects were 300 high school football and basketball players in junior and senior high schools. Trait and state anxiety were measured by Spielberger's STAI. Subjects were placed in either stressful (regular season competitive environment, and playoff competitive environment) or non-stressful situations (practice). The football players were divided into different positions based on predicted arousal: Group I-tackles, Group II-quarterbacks, Group III-defensive halfbacks, etc. Klavora found that high-trait subjects exhibited significantly higher state anxiety levels than low-trait subjects over all experimental conditions. In response to the psychological stress associated with athletic competition, state anxiety significantly increased with all subjects. These significant increases in state anxiety occurred between practice and regular season athletic environments. Klavora's results supported Oxendine's postulations that different levels of arousal are needed for optimum sports skill performance. Oxendine (1976) considered golf to require fine muscle control. He states that "for an activity such as golf putting, an extreme level of arousal is often devastating. The golfer is likely to putt the ball
much too strongly because of his general muscular
tension or, on the other hand, much too easily,
because of his fear of overputting" (p. 132). Since
golf is a sport of accuracy and precision, high levels
of anxiety may negatively affect golf performance.

The investigation here reported attempted to study
the relationship between anxiety and golf performance.
A field setting was used to provide external validity
to the findings. In addition, a field study using
actual tournament competition has provided a more
potent manipulation of the independent variable
(i.e., anxiety) than a laboratory study. Thus, high-, low-, and moderate-competition-trait-anxious golfers
have performed under stressful (competitive) and non-
stressful (non-competitive) situations.
CHAPTER III

METHODS

Subjects
The subjects were 63 male intercollegiate golfers from teams within the states of Texas, New Mexico, Michigan, and Oklahoma, ranging in age from 18 to 25. Subjects who scored in the upper 25% on SCAT were classified as high-anxious. Subjects who scored in the lower 25% on SCAT were classified as low-anxious. Subjects who scored at 50% were classified as moderate-anxious. A total of 10 high-anxious, 10 moderate-anxious, and 10 low-anxious subjects were selected for the study. Permission for use of subjects was obtained from the coach of each team, and subjects signed an informed consent form prior to test administration.

Procedures
Golfers played a practice round on Monday. Tournament play began on Tuesday and continued on Wednesday and Thursday. Eighteen holes of golf were played each day of the tournament. SCAT was administered 60 minutes before tee-off, and the state anxiety scale was administered approximately 15 minutes before the practice round on Monday. In addition, the state
anxiety scale was given approximately 15-30 minutes before tee-off on Tuesday and Thursday.

**Test Instruments**

After reviewing the literature, Martens' (1977) Sport Competition Anxiety Test (SCAT) and Spielberger's (1969) State-Trait Anxiety Inventory (SAI) were selected to assess state and trait anxiety. The SCAT was developed for the purpose of providing a reliable and valid instrument for measuring competitive trait anxiety. Items for SCAT were developed by modifying items from Taylor's (1953) Manifest Anxiety Scale, Spielberger's (1973) State Trait Anxiety Inventory for Children, and Sarason's (1960) General Anxiety Scales. In addition, some items were developed by Martens. Two methods of determining reliability were used. One procedure was the test-retest method, and the other was the use of analysis of variance. A reliability coefficient of .81 was obtained for the test-retest, and .85 for the analysis of variance method. A high internal consistency of .96 was obtained by applying the Kuder-Richardson Formula 20. Content validity was established by the evaluation of six judges. The information presented to each expert included a concise statement of the purpose of the test, a list of the
75 items to be rated for content validity on a 1-7 scale, and a yes-no response on the item's grammatical clarity. Concurrent validity was determined by correlating SCAT with the Children's Manifest Anxiety short form (Levy, 1958), the General Anxiety Scale for Children (Sarason, Davidson, Lighthall, Waite, & Ruebush, 1960) and the Trait Anxiety Inventory for Children (Spielberger, 1973). The correlations were respectively, .28, .46, .46, and .44. Construct validity was determined by testing the adequacy of hypothesized relationships between the construct being validated and other constructs in the theoretical framework (Martens & Simons, 1976).

SCAT is self-administered, and may be taken alone or in groups. It takes less than five minutes, and instructions for taking the test are printed on the inventory. It is important that the subject responds to each item according to how he generally feels in competitive sports situations. SCAT contains 15 questions, with three possible responses for each question. They are (a) Hardly ever, (b) Sometimes, and (c) Often. The 10 test items are 2, 3, 5, 6, 8, 9, 11, 12, 14, and 15. The spurious items are 1, 4, 7, 10 and 13, and are not scored, but were added in order to
diminish response bias toward the actual test items. The range of scores on SCAT is from 10 (low competitive trait anxiety) to 30 (high competitive trait anxiety).

The State Anxiety Inventory (SAI) (Spielberger, 1970) was designed to measure the transitory emotional state of the human organism which is characterized by increased anxiety levels. Reliability was determined by the test-retest method, and a reliability coefficient of .32 was obtained. This may be considered low, but is expected because state anxiety is influenced by situational factors. Alpha coefficients for internal consistency were computed by formula K-R 20, and the coefficients ranged from .83 to .92. Concurrent validity was determined by correlating SAI with the IPAT Anxiety Scale, Cattell & Schies (1963), the Taylor (1953) Manifest Anxiety Scale (MAS), and Zuckerman's (1960) Affect Adjective Checklist (AACl). Correlations between SAI and these scales were IPAT - .74, MAS - .80, and AACl - .52, respectively. Construct validity of the SAI was determined by various studies which investigated the effects of stress on state anxiety levels (Hodges, 1967; Sachs & Diesehaus, 1969).

SAI can be self-administered and may be given either individually or to groups. Complete instructions
are printed on the test form, and it takes less than six minutes to complete. To retain validity, the inventory should be presented to subjects as the Self-Evaluation Questionnaire. The subjects report on how they feel at this moment. The range of scores varies from a minimum of 20 to a maximum score of 80. Subjects respond to each item by rating themselves on a four point scale. The four categories are:
1. Not at all; 2. Somewhat; 3. Moderately so; and 4. Very much so. Some of the items are worded in such a way that a rating of 4 indicates a high level of anxiety, while other items are worded so that a high rating indicates low anxiety. The SAI has ten reversed items and ten that are scored directly. The reversed items are 1, 2, 5, 8, 10, 11, 15, 16, 19, and 20.

Statistical Procedure

High, low, and moderate competitive trait-anxious (CTA) subjects performed under competitive (i.e., golf tournament) and non-competitive (i.e., practice round) conditions. Since performance and state anxiety measures were obtained in one non-competitive and two competitive situations, a 3 (CTA) X 3 (Competition) factorial design was employed, with CTA being a between-subjects factor and competition a within-subjects factor.
Golf performance and state anxiety were the major dependent variables. Results were analyzed by a $3 \times 3$ analysis of variance with repeated measures on the second factor. A Scheffe F test analysis was employed to determine if significant differences existed between the mean scores of performance, as well as between the means of state anxiety. In addition, a Pearson Product-Moment Correlation was utilized to determine how well SCAT predicted precompetitive state anxiety and performance.
CHAPTER IV

RESULTS

State Anxiety

A 3 (CTA) X 3 (Competition) ANOVA with repeated measures on the second factor was used to investigate differences in state anxiety. The factor levels included high-, moderate-, and low-CTA subjects, and practice, the first day of competition, and the last day of competition. State anxiety tests were administered approximately 15-30 minutes before tee-off. A high score indicated high state anxiety, and a low score indicated low state anxiety. The range of possible scores was from a low of 20 to a high of 80. The table of means for state anxiety is presented in Table 2. Results indicated a significant CTA main effect $F(2,27) = 7.76, p<.002$, with the high-anxious group exhibiting the greatest amount of state anxiety. This main effect is presented in Figure 1. In addition, there was a significant competition main effect $F(2,54) = 13.67, p<.001$, with subjects displaying the highest state anxiety on the first day of competition. This effect is illustrated in Figure 2. The 3 X 3 ANOVA is presented in Table 3.
### TABLE 2

Means For State Anxiety

<table>
<thead>
<tr>
<th></th>
<th>Practice</th>
<th>Competition (First Day)</th>
<th>Competition (Last Day)</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Anxious</td>
<td>33.6</td>
<td>39.1</td>
<td>36.2</td>
<td>36.3</td>
</tr>
<tr>
<td>Moderate Anxious</td>
<td>29.3</td>
<td>34.6</td>
<td>34.3</td>
<td>32.7</td>
</tr>
<tr>
<td>Low Anxious</td>
<td>26.1</td>
<td>29.5</td>
<td>27.5</td>
<td>27.7</td>
</tr>
</tbody>
</table>

29.6 34.4 32.6

---

Fig. 1--Competition trait anxiety main effect for state anxiety.
**Fig. 2--** Competition main effect for state anxiety

**TABLE 3**

Anova Summary For State Anxiety

<table>
<thead>
<tr>
<th></th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Between Subjects</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Competition Trait Anxiety</td>
<td>2</td>
<td>560.07</td>
<td>7.76</td>
<td>.002</td>
</tr>
<tr>
<td>Error Between</td>
<td>27</td>
<td>72.17</td>
<td></td>
<td></td>
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<tr>
<td><strong>Within Subjects</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Competition</td>
<td>2</td>
<td>172.04</td>
<td>13.67</td>
<td>.00002</td>
</tr>
<tr>
<td>Competition and CTA</td>
<td>4</td>
<td>10.74</td>
<td>.85</td>
<td>.49</td>
</tr>
<tr>
<td>(Interaction)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Error Within</td>
<td>54</td>
<td>12.58</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Scheffe's post-hoc procedures were utilized to determine which CTA groups differed and which competition groups differed. Results indicated that high CTA subjects exhibited significantly higher levels of state anxiety (p < .05) than moderate and low CTA groups. No significant differences were found between the moderate or low CTA groups, although the means as presented in Table 2 were in the predicted direction. Comparisons of competition means showed significant differences on state anxiety between practice versus the first day of competition (p < .05), practice versus the last day of competition (p < .05), and the first day of competition versus the last day of competition (p < .05). An inspection of Figure 2 shows increases in state anxiety from the practice round to the first and last days of competition, with a decrease in state anxiety levels from the first day of competition to the last day of competition. However, in comparison with the practice round, state anxiety levels for the last day of competition were still in the predicted direction.

Performance

A 3 (CTA) X 3 (Competition) factorial design was used to investigate differences in golf performance. It
should be noted that a low score indicated better performance. The ANOVA is presented in Table 4, and performance means are presented in Table 5. Results indicated a significant CTA main effect $F(2,27) = 12.57, p<.0001$, with low CTA subjects exhibiting the best performance. This CTA main effect is shown in Figure 3. In addition, a significant competition main effect $F(2,54) = 12.41, p<.0004$ was found, with performance being best on practice and the first day of competition. This competition main effect is illustrated in Figure 4.

**TABLE 4**

Anova Summary For Performance

<table>
<thead>
<tr>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Subjects</td>
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<td></td>
<td></td>
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<tr>
<td>Competition Trait Anxiety</td>
<td>2</td>
<td>179.43</td>
<td>12.57</td>
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<tr>
<td>Error Between</td>
<td>27</td>
<td>14.26</td>
<td></td>
</tr>
<tr>
<td>Within Subjects</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Competition</td>
<td>2</td>
<td>96.63</td>
<td>12.41</td>
</tr>
<tr>
<td>Competition and CTA (Interaction)</td>
<td>4</td>
<td>18.06</td>
<td>2.32</td>
</tr>
<tr>
<td>Error Within</td>
<td>54</td>
<td>.06</td>
<td></td>
</tr>
</tbody>
</table>
TABLE 5
Performance Means

<table>
<thead>
<tr>
<th></th>
<th>Practice</th>
<th>Competition (First Day)</th>
<th>Competition (Second Day)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Anxious</td>
<td>76.4</td>
<td>78.2</td>
<td>81.7</td>
<td>78.7</td>
</tr>
<tr>
<td>Moderate Anxious</td>
<td>77.0</td>
<td>74.7</td>
<td>79.3</td>
<td>77.0</td>
</tr>
<tr>
<td>Low Anxious</td>
<td>73.6</td>
<td>73.3</td>
<td>74.9</td>
<td>73.9</td>
</tr>
</tbody>
</table>

Fig. 3--Competition trait anxiety main effect for performance.
The Competition by CTA interaction was not significant, although there was a trend in the data $F(4,54) = 2.32, p<.06$. Inspection of the means indicated that high CTA subjects tended to perform poorer on the first and last day of competition, while low CTA subjects performed equally well on all three days. Finally, moderate CTA subjects performed best on the first day of competition. This interaction is depicted in Figure 5.
Scheffe post-hoc procedures were employed again to test the direction of the differences for the CTA and competition main effects. Results indicated that low CTA subjects performed significantly better than moderate (p<.05) and high (p<.05) CTA subjects. There were no significant differences between moderate and high CTA subjects, but inspection of Figure 3 shows the moderate CTA subjects displaying better performance than the high CTA subjects as predicted. Scheffe's
test also indicated that subjects performed significantly better on practice and on the first day of competition than during the last day of competition (p<.05). There was no difference in performance between practice and the first day of competition.

Relationship Between SCAT, State Anxiety, and Performance

In order to determine the relationship between SCAT and performance, a Pearson Product-Moment Correlation was computed. Results showed significant positive correlations between SCAT and performance on the first day of competition: r=.45, p<.006. In addition, SCAT correlated marginally with performance on the last day of competition: r=.27, p<.07. No significant difference was found between SCAT and performance on the practice round. Correlational procedures were also computed to determine the relationship between SCAT and state anxiety. Significant correlations were found for non-competition: r=.50, p<.002, the first day of competition: r=.57, p<.001, and the last day of competition: r=.54, p<.001. Thus, SCAT was a good predictor of state anxiety both in competition and practice.
CHAPTER V

DISCUSSION

In the present investigation 63 male collegiate golfers were administered the Sport Competition Anxiety Test, from which 10 high-, 10 moderate-, and 10 low-CTA subjects were selected. These groups were administered the State Anxiety-Inventory before practice and before the first and last day of competition. This discussion will examine state anxiety and performance results along with the interrelationship between state anxiety and performance. Finally, the relationship between SCAT, state anxiety, and performance will be examined.

State Anxiety

State anxiety results indicated that significantly more state anxiety was evidenced during both days of competition than during practice. Support for these results are offered by several studies. For example, Martens & Simons (1976) conducted two field studies, using boxing classes and collegiate female basketball players. Boxing subjects were administered a state anxiety test in a non-competitive situation (regular classes) and 30 minutes before boxing competition. Basketball players were administered the State Anxiety
Inventory before a practice session and immediately before a competition. Results showed a significant increase in state anxiety from non-competition to competition. Another field study by Klavora (1975) found that state anxiety increased substantially for basketball and football players before competition, as compared with practice. Previous research (Johnson & Hutton, 1953; Oxendine, 1968, 1970) has also provided support for the notion that competition causes increases in state anxiety when compared to non-competition settings. Martens (1977) suggests that increases in state anxiety during competition are due to the increased evaluation by others inherent in competitive settings.

Post-hoc tests also revealed that state anxiety levels on the third day of competition were significantly lower than the first day of competition. This difference can be best explained via an understanding of the environmental conditions under which golfers performed. First, the subjects had more course experience (having played the course three times) on the third day than the first day of competition; therefore subjects may have been more confident and felt less apprehension. Second, on the first day of competition all golfers and teams had an equal opportunity to win or place high
in the final standings of the tournament. In comparison, subjects on the third day of competition may have been out of contention and felt less motivated, thereby lowering state anxiety. Third, rainy conditions on the last day of competition may have caused the subjects to become more concerned with personal comfort than with the competition, thereby diverting the direction of concentration from the tournament and its subsequent pressures.

Results also indicated a significant CTA main effect, with high CTA subjects exhibiting the highest levels of state anxiety. In addition, post-hoc tests revealed that high CTA subjects exhibited significantly greater levels of state anxiety than moderate and low CTA subjects. Although there was no significant difference between moderate and low CTA subjects, the means were in the predicted direction. The results are consistent with Spielberger's (1972) trait-state theory of anxiety, which predicts that high trait-anxious subjects will manifest greater increases in state anxiety than low trait-anxious subjects under situations perceived as threatening to self esteem. In addition, Spielberger (1971) suggests that a difficult task or one requiring complex motor skills would be expected to cause high levels of state anxiety.
in most high-trait anxious subjects. Additional support for the results is offered by Spence & Spence (1966), who emphasize that high trait-anxious subjects tend to do more poorly than subjects who are low in trait anxiety under conditions that invoke failure or negative evaluation of performance. Thus, the research literature generally indicates that high trait-anxious individuals exhibit greater levels of state anxiety than individuals with low trait anxiety when confronted with a stressor (Carron & Moford, 1968; Martens, 1977; Martens & Gill, 1975; Martens & Simons, 1976; Sarason, 1960; Spence & Spence, 1966; Spielberger, 1966, 1971). Since golf is a complex skill and the tournament was high in evaluation, the results of the present investigation are in agreement with the above literature.

Performance

Performance results indicated a significant CTA main effect, with low CTA subjects performing significantly better than moderate and high CTA subjects. Although post-hoc tests showed no significant difference between moderate and high CTA subjects, an inspection of Table V indicates the means were in the predicted direction. These findings are in agreement with the anxiety-motor performance literature for a complex or
difficult task (Farber & Spence, 1953; Matarazzo & Matarazzo, 1956; Oxendine, 1968, 1970; Pinneo, 1961) and extends them to a field study using a sport skill. Additional support is provided in studies by Carron (1965), who reported that on a task of high difficulty (balancing task), low-anxious subjects proved significantly superior, and by Eysynck & Gillan (1964), who found that high-anxious subjects performed at a level inferior to that of low-anxious subjects in a hand-steadiness test.

The CTA performance results, when combined with the CTA state anxiety results, are consistent with Oxendine's (1968; 1970) theory that different levels of arousal are needed for optimal performance in different sports skills. He proposes that activities using mostly endurance strength, or speed, require extremely high levels of arousal. Those skills that demand a combination of these factors such as gymnastics or boxing, need a more moderate level of arousal. A low arousal level is desired for activities which require well coordinated movements and fine muscle control. Since golf demands these latter qualities, Oxendine postulates that a low level of arousal would be required for optimal performance. The results of the present
investigation support this notion since low CTA subjects exhibited the lowest state anxiety but the best golf performance.

Oxendine's theory appears to conflict with the Inverted-U Hypothesis, which predicts that performance improves with increasing levels of arousal up to an optimal point, whereupon further increases in arousal impair performance. However, this study was not specifically designed to test the Inverted-U Hypothesis. In order to properly test this hypothesis, Martens (1977) concludes that three levels of stress and three levels of trait anxiety are needed. Since the present investigation did not meet this criterion, no firm conclusions can be made concerning the Inverted-U relationship.

A significant competition main effect was found, and post-hoc tests revealed that performance was best during practice and the first day of competition. A comparative look at the relationship between the performance competition main effect and the state anxiety competition main effect reveals some discrepancies. During the practice round, state anxiety was at its lowest level, for example, and thus the best performance would be predicted during practice. However, inspection of the performance means indicated no differences between
practice and the first day of competition. A closer look at the conditions of each day, however, may provide an explanation for these results. During the practice round subjects, were not familiar with the course, and this may partially account for performance levels not being as high as predicted. Performance on the third day of competition proved to be the poorest of all three days, while state anxiety decreased from the first day of competition to the third day of competition. A closer inspection of the playing conditions on the third day of competition may offer an explanation for this contradiction. It began raining approximately one hour before tee-off time and continued as a drizzle through the entire day. The tournament was briefly delayed and many players were unsure whether the tournament would continue; this might have changed the focus of attention away from tournament pressures. Since the rain was continuous, the majority of competitors were unable to hit practice balls or properly warm up. In addition, the golf course itself was not in a desirable playing condition, and these conditions were manifested in poorer performance by the golfers. Comments by coaches indicated their concern about poor performance from their players because of the disruption of concentration,
poor playing conditions, and the lack of pre-competitive preparation. With improved playing conditions, performance and state anxiety results may have had a more accurate relationship on the last day of competition.

Relationship Between SCAT, State Anxiety and Performance

A Pearson Product Moment-Correlation between SCAT and performance was computed, with the results indicating a significant relationship between SCAT and performance for the first day of competition, and a marginally significant one for the last day of competition. These results are consistent with Martens' theory of competitive trait anxiety, which states that SCAT is a predictor of performance in competition. However, these findings disagree with two laboratory experiments conducted by Martens (1977), who found no relationship between SCAT and performance, and concluded that state anxiety levels created in laboratory settings may not be as great as in field studies. Since the SCAT performance relationship is mediated by state anxiety, the laboratory-induced anxiety levels may not have been strong enough to predict motor performance. However, this investigation was conducted in a field study where there were higher levels of state anxiety (i.e., more evaluation), and this could explain why significant correlations were found between SCAT and performance during competition.
The Pearson Product Moment-Correlation was also computed to measure SCAT's relationship with state anxiety. Results indicated significant correlations for both days of competition. These findings agree with a field study conducted by Scanlan & Passer (1976), who investigated the relationship between SCAT and state anxiety among boys 9-12 years of age, participating in a soccer league. SCAT was administered at the start of the season and Spielberger's (1973) State Anxiety for Children (SAIC) was given approximately 30 minutes before competition. Results showed that SCAT was a significant predictor of precompetitive state anxiety. Other studies offer strong support for SCAT as an excellent predictor of state anxiety in competition (Gerson & Deshaies, 1976; Martens & Simons, 1976). However, results of the present investigation also indicated a significant correlation between SCAT and the practice round, which seems to be an apparent contradiction of the literature. Martens (1975), however, maintains that a competitive situation exists when "the comparison of an individual's performance is made with some standard in the presence of at least one other person who is aware of the criterion for comparison and can evaluate the comparison process" (p. 69).
In addition, Cottrell (1968) suggests that arousal increases only when those present are in position to evaluate one's ability. Therefore it can be assumed that increases in state anxiety are, to a large extent, caused by evaluation apprehension. In this investigation, golfers played in fivesomes which included teammates and coaches during the practice round. Furthermore, each golfer is all alone while performing, and any mistake, whether large or small, is glaringly obvious. Thus the opportunity for evaluation by others is greater than in many other sports. Therefore the practice round may have been more of a competitive situation than theorized, and could explain the high correlation between SCAT and state anxiety.

Thus, in summary, results provided support for Oxendine's theory that low arousal would produce the best performance in golfers. In addition, the finding that low CTA golfers exhibit lower levels of pre-competitive state anxiety than moderate and high CTA golfers, the increase in golfers' state anxiety levels from non-competition to competition, and the prediction that state anxiety levels affect performance were consistent with the literature. Finally, the research also supported the finding that there was a relationship
between SCAT, state anxiety, and performance in a competitive setting. Therefore, further field research should provide additional information for understanding the relationship between anxiety and motor-performance.
Purposes and Procedures

The purposes of the study were (1) to determine if state anxiety affected the performance of subjects differing in Competition Trait Anxiety, (2) to determine if subjects differing in Competition Trait Anxiety exhibited different levels of state anxiety in a competitive and non-competitive setting, (3) to determine if CTA golfers perform differently, and (4) to examine the relationship between SCAT, state anxiety and performance.

The subjects were 63 collegiate male golfers from the states of Texas, Oklahoma, New Mexico, and Michigan, of which 30 scored either high, moderate, or low on Competition Trait Anxiety. Golfers played a practice round on Monday, with tournament play beginning on Tuesday and continuing on Wednesday and Thursday. Eighteen holes of golf were played each day of the tournament, which took place in September of 1979, at the Denton Country Club, in Denton, Texas. SCAT was administered approximately 15 minutes before the practice round, and before competition on Tuesday and Thursday. Data were analyzed by use of a 3 (CTA)
by 3 (Competition) ANOVA with repeated measures on the second factor to determine significant differences between CTA groups and competition conditions. Alpha was set at .05, and Scheffe's F test was utilized to determine if significant differences existed between mean scores of performance, and state anxiety. In addition, correlational analysis was employed to determine the relationship between SCAT, pre-competitive state anxiety, and performance.

Results and Conclusions

The following are the results and conclusions of the investigations. First, low CTA golfers performed better than high and moderate CTA golfers in competitive and non-competitive settings. These findings are consistent with Oxendine's (1968, 1970) theory that low arousal is best in tasks that are complex and require fine muscle control, and well-coordinated movements. Therefore, it can be concluded that low arousal is best suited for optimal performance in golf skills.

Second, low CTA golfers exhibited lower levels of state anxiety than high and moderate CTA golfers in competition. Research (Martens, 1977; Martens & Gill, 1975; Spence & Spence, 1966; Spielberger, 1966, 1971)
provides support for these results, with a general agreement that low-anxious subjects exhibit lower levels of state anxiety than high-anxious subjects when confronted with a threatening situation. Thus, it can be concluded that low CTA golfers perceive competition to be less threatening than do moderate and high CTA golfers.

Third, high CTA golfers exhibited higher levels of state anxiety than moderate and low CTA golfers before performing in a non-competitive setting. These findings appear to contradict Martens' (1977) assumption that there would be no differences in state anxiety between high and low CTA subjects in non-competitive settings. However, Martens (1976) suggests that a competitive situation exists when "the comparison of an individual's performance is made with some standard in the presence of at least one other person who is aware of the criterion for comparison and can evaluate the comparison process" (p. 14). During the practice round there was an opportunity for evaluation by teammates and coaches. Therefore, the practice situation could be seen as a type of competition (i.e., evaluation), but still not as evaluative as the competition itself. Thus, it would be expected that differences would be found between CTA golfers.
Fourth, collegiate golfers exhibit higher levels of state anxiety in competitive versus practice settings. Research (Johnson & Hutton, 1953; Klavora, 1975; Martens & Simons, 1976; Oxendine, 1968, 1970) using other motor tasks has shown strong support for these results, and therefore it can be concluded that state anxiety levels increase from a less threatening (practice) situation to a more threatening (competition) situation.

Fifth, there was a significant relationship between SCAT and precompetitive state anxiety. This is supported by previous research, which has found a high correlation between SCAT and state anxiety (Gerson & Deshies, 1976; Martens & Simons, 1976; Scanlan & Passer, 1977). Therefore, it can be concluded that there is a strong relationship between SCAT and precompetitive state anxiety.

Recommendations

The following recommendations are offered;

1. A replication of this study should be conducted using a larger sample size.
2. A replication of this study should be conducted using male and female subjects.
3. This study should be repeated using high school male and female competitive golfers.
4. Further investigations of a similar nature should be conducted in which other sports skills are examined.

5. A replication of this study should be conducted with the state anxiety test being administered on each day of the tournament.

6. A replication of this study should be conducted testing the effects of other psychological variables, such as confidence, self esteem, etc., on an individual's golf performance.
References


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**DIRECTIO'S:** A number of statements which people have used to describe themselves are given below. Read each statement and then mark the appropriate response to the right of the statement to indicate how you feel right now, that is, at this very moment.

There are no right or wrong answers. Don't spend too much time on any one statement but give the answer that seems to describe your present feelings best.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Not at all</th>
<th>Somewhat</th>
<th>Moderately so</th>
<th>Very much so</th>
</tr>
</thead>
<tbody>
<tr>
<td>I feel calm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I feel secure</td>
<td></td>
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<tr>
<td>I am tense</td>
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</tr>
<tr>
<td>I am regretful</td>
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<td></td>
</tr>
<tr>
<td>I feel self-confident</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I feel nervous</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am jittery</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I feel &quot;high strung&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am relaxed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I feel content</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am worried</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I feel over-excited and rattled</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I feel joyful</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I feel pleasant</td>
<td></td>
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</tbody>
</table>
Illinois Competition Questionnaire - Form A

Name: ________________________________ Age: ____ Sex: __________

RECTIONS: Below are some statements about how persons feel when they compete in sports and games. Read each statement and decide if you HARDLY-EVER, or SOMETIMES, OFTEN feel this way when you compete in sports and games. If your choice is HARDLY-EVER, blacken the square labeled A, if your choice is SOMETIMES, blacken the square labeled B, and if your choice is OFTEN, blacken the square labeled C. There are no right or wrong answers. Do not spend too much time on any one statement. Remember to choose the word that describes how you usually feel when competing in sports and games.

<table>
<thead>
<tr>
<th>Hardly-Ever</th>
<th>Sometimes</th>
<th>Often</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Competing against others is socially enjoyable.</td>
<td>□ A</td>
<td>□ B</td>
</tr>
<tr>
<td>2. Before I compete I feel uneasy.</td>
<td>□ A</td>
<td>□ B</td>
</tr>
<tr>
<td>3. Before I compete I worry about not performing well.</td>
<td>□ A</td>
<td>□ B</td>
</tr>
<tr>
<td>4. I am a good sportsman when I compete.</td>
<td>□ A</td>
<td>□ B</td>
</tr>
<tr>
<td>5. When I compete I worry about making mistakes.</td>
<td>□ A</td>
<td>□ B</td>
</tr>
<tr>
<td>6. Before I compete I am calm.</td>
<td>□ A</td>
<td>□ B</td>
</tr>
<tr>
<td>7. Setting a goal is important when competing.</td>
<td>□ A</td>
<td>□ B</td>
</tr>
<tr>
<td>8. Before I compete I get a queasy feeling in my stomach.</td>
<td>□ A</td>
<td>□ B</td>
</tr>
<tr>
<td>9. Just before competing I notice my heart beats faster than usual.</td>
<td>□ A</td>
<td>□ B</td>
</tr>
<tr>
<td>10. I like to compete in games that demand considerable physical energy.</td>
<td>□ A</td>
<td>□ B</td>
</tr>
<tr>
<td>11. Before I compete I feel relaxed.</td>
<td>□ A</td>
<td>□ B</td>
</tr>
<tr>
<td>12. Before I compete I am nervous.</td>
<td>□ A</td>
<td>□ B</td>
</tr>
<tr>
<td>13. Team sports are more exciting than individual sports.</td>
<td>□ A</td>
<td>□ B</td>
</tr>
<tr>
<td>14. I get nervous wanting to start the game.</td>
<td>□ A</td>
<td>□ B</td>
</tr>
<tr>
<td>15. Before I compete I usually get up tight.</td>
<td>□ A</td>
<td>□ B</td>
</tr>
</tbody>
</table>