THE ATTENTIONAL STYLE OF INTERCOLLEGIATE

ATHLETES BASED ON GENDER

AND TYPE OF SPORT

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CHAPTER I

ATTENTION AND PERFORMANCE

Introduction

As athletes progress from little league to high school, from high school to college, and for the fortunate few that make it, from college to professional and elite levels, the differences in athletic ability becomes smaller and smaller. As the athletes move up the ladder to the next level of competition they must go beyond their physical ability and long hours of practice to the playing field of the mind where championships are often won or lost. At the highest levels performance is determined as much by mental abilities as it is by sheer physical capabilities (Nideffer, 1976b). Therefore, the door to peak performance is a union of mind and body. This door is unlocked and opened by the keys of proper attentional training and focus.

The importance of attention for understanding and predicting human behavior has long been emphasized since the beginning of experimental psychology in the mid 1800's by Hamilton (1859), Muller (1873), Phillsbury (1901). It was some time later that attention became of great interest in

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the world of human performance as described by Easterbrook (1959), Wachtel (1967), and Shakow (1962). In fact, it is hard to imagine a variable more central to mental abilities and performance than the ability to direct and control one's attention (Landers, 1980).

Psychological theories have been developed to improve the ability to understand, predict, and control human behavior. However, a large body of theory from psychology is designed to explain "abnormal" behavior. Robert Nideffer was an early pioneer interested in predicting and controlling the behavior for optimal "peak" performance. Highly successful individuals, regardless of the areas in which they work, are usually better predictors of the behavior of people around them. In his book The Inner Athlete, Nideffer operationally defined the attentional demands placed on athletes in a variety of competitive situations. There appear to be those coaches, athletes, executives, teachers, and others, who seem to instinctively do and say the right thing at the right time. This is accomplished by concentrating on the task relevant cues that the given situation provides.

Just as there are physiological differences and intellectual differences among people, there are also differences in attentional abilities. Each individual has attentional strengths or a "preferred attentional style". These differences in attentional abilities may be due to several factors:

A. genetic and/or hereditary differences

(e.g., differences in information storage

capacity or differences in perceptual acuity).

B. learned differences, differences due to

environmental factors and to exposure levels

(e.g., the opportunity to practice certain

skills).

C. alterations in biochemistry

(e.g., hormonal imbalances, drug induced

changes).

Nideffer (1989) believed that the difference between

the type of disorganized behavior seen when an otherwise

normal individual panics under stress (e.g. on an exam, in

an emergency situation, when speaking in public) and the

highly organized behavior of individuals who excel under

pressure is due to differences in their control over arousal

and specific attentional processes. "Attention to the

demands of the task is potentially under the control of the

athlete" (Singer, 1991, p. 93).

However, it is easy to become distracted and to lose

appropriate focus. In fact, maintaining the proper

attentional focus is one of the most difficult tasks a

champion must master (Nideffer, 1976). Some athletes have

this ability naturally and others must develop their attentional style in order to perform successfully and be able to move up the ladder to a higher level of competition in their respective fields.

The theory of attentional style, as proposed by Nideffer (1976a, 1976b, 1981), offered an explanation about how athletic performance may be related to one's tendency toward a particular style of attention. This concept draws heavily upon Easterbrook's (1959) cue utilization theory. According to Nideffer's theory, at any particular point in time an individual's attentional focus ranges somewhere along a continuum between broad and narrow. At the same time one's attentional focus is located along this continuum, it is also being directed toward either internal thoughts and feelings or external stimuli present in the environment. In addition, there is a natural tendency for an individual to function within a limited range along each of these two dimensions of attention (Nideffer, 1981). A person's focus of attention is frequently referred to as the individual's "preferred attentional style."

Therefore, attention and performance are naturally tied together. In the performance world of entertainment, sports, and to some degree the performance that lawyers must put on for juries, and more specifically the ability to control one's attention to be able to focus just on the task

at hand, is tied to success. Success often is determined by an outside peer group, but more importantly, success as defined and perceived by the performing individual. Performers (i.e., athletes, lawyers, actors, musicians, teachers) possess different personality structures (Morgan, 1980). Therefore, they presumably have different psychic needs and should be handled in a individualized fashion. Application of psychological methods to groups will likely be just as ineffective as the prescription of medication on a group basis. Therefore, personalized needs must be taken into account.

Many sports enhancement techniques (e.g., relaxation and visualization) directly or indirectly influence attention, and can increase the probability that a more ideal performance will be achieved. To successfully execute psychomotor skills performers must be able to selectively attend to and concentrate on relevant task cues while disregarding irrelevant cues (Easterbrook, 1959).

Thus, a justification for the study of attentional styles was that those individuals responsible for a performer or athlete's care, treatment, and training must be thoroughly acquainted with that person's history and psychological makeup to help facilitate optimal performances. It is absolutely imperative that all persons concerned with the athlete be made aware of the need to

manage athletes on a highly individualized basis. Decisions concerning training intensity and duration as well as goal-setting should be based upon objective input from coaches, trainers, physicians, and consultants such as exercise physiologists, sports psychologists, or psychiatrists where possible or when necessary.

Purpose of the Study

The purpose of this study was to investigate the relationship between gender, type of sports, and elite college athletes' attentional styles as measured by Nideffer's Test of Attentional and Interpersonal Style (TAIS). More specifically, this study will attempt to examine whether attentional style differences do exist between NCAA Division 1-A male and female athletes and to discriminate between those that participate in individual sports versus team sports on the basis of the TAIS's six attentional subscales (BET, BIT, OET, OIT, NAR, RED).

Hypotheses

The following hypotheses will be tested at the .05 levels.

1. There will be no significant difference between athletes who participate in team sports versus individual sports on the following selected TAIS subscales:

(a)   Broad external attentional focus, BET,

(b)   Overloaded by external stimuli, OET,

(c)   Broad internal attentional focus, BIT,

(d)   Overloaded by internal stimuli, OIT,

(e)   Narrow attentional focus, NAR,

(f)   Reduced attentional focus, RED,

2.   There will be no significant difference between female and male athletes on the following TAIS subscales:

(a)   Broad external attentional focus, BET,

(b)   Overloaded by external stimuli, OET,

(c)   Broad internal attentional focus, BIT,

(d)   Overloaded by internal stimuli, OIT,

(e)   Narrow attentional focus, NAR,

(f)   Reduced attentional focus, RED,

Assumptions

1.   The subjects carefully read and properly followed the directions of the instrument.

2.   The subjects honestly completed the questionnaire.

3.   The testing environment was conducive to accurate administration of the instrument.

Limitations of the Study

The results of this study may be affected by the following:

1. The investigation relied on self-report.
2. Subjects were not selected randomly.
3. Subjects were not representative of all NCAA Division 1 athletes.

Delimitations

1. The subjects volunteered to take part in the study.
2. Subjects were students athletes attending a state supported institution of higher education in the state of Oklahoma.
3. Subjects attentional style was measured with one instrument, the Test of Attentional and Interpersonal Style.

Definitions

Behavior Control (BCON): A high score indicates that individuals tend to be somewhat implusive. In addition, they engaged in behavior that could be considered anti-social, though not necessarily harmful.

Broad External Attentional Focus (BET): High scores on this scale are obtained by individuals who describe

themselves as being able to effectively integrate many stimuli at one time.

Broad Internal Attentional Focus (BIT): High scores indicate that athletes see themselves as able to effectively integrate ideas and information from several different areas.

Closed Skill: Performance of a task in which several variables are known and repeated (i.e. basketball free throws)

Control Scale (CON): A high score indicates that individuals are in control of most of the situations, interpersonal and otherwise, they find themselves in. It also means they attempt to gain control of situations,

Depression (DEP): Reflects an individual's reactive depression.

Extroversion (EXT): A high score indicates the individual is warm, outgoing, needs to be with people, is the life of the party.

Information Processing (INFP): High scores tend to process a great deal of stimulus information. Their percepual-cognitive worlds are busy.

Intellectual Expression (IEX): A high score indicates that individuals express their thoughts and ideas to other people.

Introversion (INT): A high score indicates the person likes to be alone, enjoys qiuet thoughful times, and aviods being the center of attention.

Narrow Attentional Focus (NAR): The higher the score, the more effective athletes see themselves with respect to being able to narrow their attention when they need to.

Negative Affective Expression (NAE): A high score indicates that individuals express their anger and negative feelings to others.

Obsessive (OBS): A high score indicates the person has a tendency to ruminate and worry about one particular thing without any real resolution or movement.

Open Skill: Performance of a task in which many unknown variables are known and repeated (i.e. passing skill in football).

Overloaded by External Stimuli (OET): The higher the score, the more athletes make mistakes because they become confused and overloaded with external stimuli.

Overloaded by Internal Stimuli (OIT): The higher the score, the more mistakes athletes make because they get confused by thinking about too many things.

Physical Orientation (P/O): A high score indicates the individual participates in and enjoys competitive athletics.

Positive Affective Expression (PAE): A high score indicates the individuals express their feelings of affection to others in both physical and verbal ways.

Reduced Attentional Focus (RED): A high score on this scale indicates that the individual makes mistakes because they narrow their attention too much.

Self-esteem (SES): The higher the score, the more highly the individuals think of themselves.

CHAPTER II

REVIEW OF LITERATURE

Introduction

This chapter presents a review of literature which
focuses on four areas: the theory of attentional styles,
instrument development for the Test of Attentional and
Interpersonal Styles inventory, TAIS and athletic
performance, and other applications of the TAIS.
Additionally, an overview of the chapter is presented.

Theory of Attentional Styles

Ideas about attention as a viable psychological concept
began to be explored around the time the new experimental
psychology was taking hold in Germany (Silverman, 1964). It
was at this time that the early work supporting the concept
of attention emerged (Berlyne, 1970). Fundamentally,
attention was believed to be a dynamic concept of selection.
The human organism, using its sensory systems, must take in
information that is useful and know what inputs to disregard
(Easterbrook, 1959). A large part of psychology has been

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taken up with the study of how the human organism chooses what to attend to and what sensations to let pass away.

Sir William Hamilton in his 1859 lectures on metaphysics and logic first introduced the concept of measuring the range of attention. Other early pioneers and works included G.E. Muller's 1873 classic paper on the conditions of attention and Lange's 1888 concept of attention which introduced the doctrine of determining tendency by using reaction times (Berlyne, 1970).

The theory of attention played a role in the psychology of perception and was later used by Schumann to explain the formation of Gestalten in 1901, a dozen years before the Gestalt psychologists came into existence (Boring, 1970).

Attention is an essential component to the human information processing system. It has been described as a filter (Broadbent, 1958), a pertinence detector (Norman, 1969), and a resource allocator (Kahneman, 1973). Because the human system is not able to process all information available to the senses at one time, it has been described as having a limited capacity. Therefore, attention is necessary to gate information to the limited processor (Dewey, Brawley, & Allard, 1989).

Early attentional models (Broadbent, 1958; Welford, 1959) highlighted the filter role of attention for incoming information. Subsequent models described the role of attention as a filter for the selection of the correct movement execution (Deutsch & Dectsch, 1963; Norman &

Shallice, 1980). It appears that the process of attention influences information processing in a continuous fashion, from the selective intake of information, to the planning of the act, to its actual execution (Singer, Cauraugh, Tennant, Murphy, Chen, & Lidor, 1991).

Attention can be conceptualized on a two dimensional plane containing width of focus and direction (Nideffer, 1976a). Attention can also vary from a very narrow focus, filtering out a great deal of information, to a very broad focus (Cromwell, 1968; Easterbrook, 1959; Wachtel, 1967). One can also attend to external (environmental) or internal (thoughts, feelings) stimuli (Heilbrun, 1972; Shakow, 1962). Most people maintain a balance between these two directions, shifting from one to the other. According to Nideffer (1976a, 1976b), at any single time, attention can be described on the basis of both its width and direction.

Attentional style is a trait that differentiates among individuals. Nideffer's (1976a, 1976b), drawing from the work of Wachtel (1967) and Silverman (1964), described attention competencies as being divided into a two-dimensional matrix: width (narrow to broad) and direction (internal to external). Width refers to the number of elements one can attend to in a stimulus field. Direction refers to whether an individual's attentional focus is directed to internal or external stimuli.

Van Schoyck and Gasha's (1981) results provided support for other views of attention (Schlesinger, 1954: Wachtel, 1967) that conceptualized bandwidth as multidimensional regarding both the scanning and focusing components. Their factor analysis yielded two factors: (1) a "scan" factor involving BET, BIT and INFP scales and (2) a "focus" factor consisting of the attentional scales of OET, OIT and NAR. This "focus" factor indicates the subjects' inability to concentrate and was the factor that Van Schoyck and Grashs suspected would correlate most with anxiety.

Nideffer (1976b) viewed attention as being crucial to effective human performance. He stated that "it is difficult to conceive a single situation in which ignoring others is not critical to effective performance. It does not matter if the person is involved in a complex sport, walking across the street, reading a book, or making a simple decision" (Nideffer, 1981).

Investigators in the area of sport psychology have long sought a method for assessing the influence of attention on motor performance (Morgan, 1980). The theory of attentional style as proposed by Nideffer (1976a, 1976b) offers an explanation as to how athletic performance may be related to one's predisposition toward a particular style of attention.

Nideffer (1976a, 1976b, 1981) proposed that individuals differ in attentional capabilities. For instance, certain individuals may have an attentional style which allows them

to see the whole environment (broad-external focus) while others may not have successfully integrated such an attentional style. Nideffer (1976a) has developed a personality inventory, the Test Of Attentional and Interpersonal Style (TAIS), in order to assess those individual differences.

In addition to measuring the ability to develop different types of attention, it was also important to measure the ability to shift from one attentional focus to another in response to the changing environmental demands (Nideffer, 1976a, 1976b). The ability to shift was measured by asking subjects to describe the type and frequency of attentional errors they found themselves making. For example, if you have a broad-external focus of attention and fail to shift when the task requires you to narrow, there is a tendency to become overloaded and confused by all the activity going on around you. The TAIS would indicate that you made mistakes because you become distracted by the environment and could not concentrate on the task at hand. This was caused by a failure to shift attentional focus.

Another key element in Nideffer's theory is the basic assumption that various behavioral tasks place different situational demands on a performer's attention. Nideffer (1976a, 1976b) had organized these situational demands into four distinct categories: broad-external, broad-internal,

narrow-external, and narrow-internal. To the extent that one's personal attentional style matches the specific situational demands of a given task, the more proficient one is likely to be in performing that task. As arousal increases the athlete's attention moves in the direction of their preferred style. As a result of this it becomes more difficult to shift their attentional focus from one style to another style (e.g., from narrow-internal to broad-external), even when a shift in attention would be more appropriate for the given attentional demand of the situation. Furthermore, according to Nideffer (1976a, 1976b, 1981), with an increase in the level of competitive arousal, one's attentional focus began to narrow involuntarily. Thus, the amount of information from both internal and external sources that may be processed and evaluated is greatly reduced. Performance will suffer when the excluded information contains cues relevant to the task at hand (Easterbrook, 1959, Bacon, 1974).

Nideffer (1976b) suggested that most significant change in an individual's attentional focus under high levels of arousal, was one's tendency to become more internally focused. As Nideffer described it, "The person becomes distracted by his own bodily feelings (beating heart, muscle tension, and so on) and his thoughts (why did the runner leave base, what's the matter with me, I might choke, and so

on)." Thus as attention is directed internally, the ability to concentrate on the game deteriorates (Nideffer, 1978).

The overloaded external (OET) subscale measures the tendency to become overloaded and distracted by external cues, this distraction results from a failure to shift from a broad-external focus. The overloaded internal (OIT) subscale measures the tendency to become overloaded and distracted by internal cues. There is a breakdown and failure to shift from a preoccupation with one's own thoughts and feelings. Subjects described themselves as distracted and unable to concentrate due to internal sources of interference. The reduced attentional focus (RED), measures the tendency to continue to narrow attention when the task or performance situation requires you to broaden and consider more information (Nideffer, 1976a, 1976b). Subjects who score high on this scale make errors of underinclusion. They make decisions without considering all the relevant information.

Common distractors in sports situations are associated with (a) internal states and (b) external events. In cognitive psychology in general and sport settings in particular, experts are being compared more and more with novices to determine the way such processes as attention are allocated to tasks (Singer, Cauraugh, Tennant, Murphey, Chen, & Lidor, 1991).

Instrument Development of the TAIS

Nideffer (1976a) developed the test of attentional and interpersonal style (TAIS) to assess attentional constructs. The test contains 17 scales, six reflecting attentional processes, two involved with behavioral and cognitive control, and nine mapping interpersonal style. The six attentional scales were designed to assess various combinations of attentional direction and bandwidth. Nideffer (1976a, 1976b, 1981) suggested that certain sports require a particular combination of the direction and bandwidth dimensions for an athlete to perform adequately.

A major goal in developing the test of attentional and interpersonal styles was for it to be used in client feedback and to make treatment recommendations. Another reason for developing the test was to use it as a training tool (Nideffer, 1976a). The understanding provided by the theory behind the test might help prevent the client and therapist from being distracted by irrelevant information. Once developed the test becomes a tool for teaching about the underlying theory and human behavior. In effect, the test becomes a base for providing the subjects with an understanding of themselves (Nideffer, 1976a).

Although there are other questionnaire measures of attention, the concept of attentional style as proposed by Nideffer's TAIS is most closely related to Easterbrook's (1959) ideas of cue utilization. However, in contrast to

the dual-task paradigm for the measurement of attention on a broad-narrow continuum as Easterbrook (1959) had done, Nideffer (1976a) like Silverman (1964) and Wachtel (1967) viewed attention as two-dimensional, consisting of width (broad-narrow) and direction (internal-external).

Nideffer (1976a) wrote an instrument that would be useful as a predictor of performance in a wide variety of settings. Following the work by McClelland (1973), Wallace (1966), and Jackson (1971), he included a large number of items designed to reflect attentional and interpersonal characteristics. Nideffer (1976a) used the information from the TAIS to predict performance, determine decision-making capabilities under both stressful and nonstressful situations, and assist in providing counseling and training programs. This information has be used with psychiatric patients, normal populations and elite performers.

Nideffer (1976a, 1976b) believed that by using the TAIS it is possible to plot a person's ability to develop the four different types of attention proposed based upon his theory of attentional styles. In addition, Nideffer (1976b) stated that it is also possible to plot the tendency to make mistakes because of a failure to shift attention style. The attentional plots can be compared to describe the relative attentional effectiveness of the subject.

For the initial sample three hundred undergraduate and graduate college students were tested (150 females and 150

males). This was done to determine the structural consistency and validity of the test scales. It was also done to establish means and standard scores for the different subscales. Undergraduates and graduate college students were selected to develop the normative data for several reasons (Nideffer. 1981a, 1989, 1993) First these individuals were old enough and bright enough to respond to the test. The college students would have had the opportunity to experience all of the behavioral situations described in the test. Also, college students are a select and effective group. Their success up to this time in their life verifies that they can develop many of the attentional characteristics that Nideffer (1976a) believed to be critical. Thus, college students provided a good base against which comparison with other population could be made.

When taking the test each subject was asked to read each item and to indicate the frequency with which it described their behavior. The subjects answered using a five item response Likert scale. Each item received a numerical score ranging from 0 to 4. The score for all the items are then summed. Once a subject's raw scores are calculated they are plotted on the profile. The raw score profile was based on norms for undergraduates and graduate college students.

An item analysis procedure was used to refine the scales. This analysis involved correlating each item contained in a subscale with the subject's total score for the subscale after correcting for the item's inclusion in the total subscale score. All items which failed to correlate at the .01 level of significance or greater were removed (Nideffer, 1976a).

A visual examination of the relationship between a particular subject's score on the various subscales made it possible to identify their relative attentional strengths and weaknesses. This information was then compared with the task and attentional demands of any situation that seemed to be presenting problems for that individual. Through this comparison subjects can identify the possible reasons for the types of mistakes they are making. In other words, subjects can be alerted to potential problems before they develop.

Nideffer's (1976) Test of Attentional and Interpersonal Style (TAIS) contains six subscales designed to measure attentional abilities varying in width and directional focus. High scorers on these six scales are characterized as follows:

1. Broad external attentional focus (BET) - ability to integrate many environmental stimuli at one time.

2. Overloaded by external stimuli (OET) - tendency to make mistakes due to being confused and overloaded by environmental information.

3. Broad internal attentional focus (BIT) - ability to effectively integrate ideas and information from several different areas.

4. Overloaded by internal stimuli (OIT) - tendency to make mistakes due to confusion from thinking about too many things at once.

5. Narrow attentional focus (NAR) - ability to effectively narrow attention.

6. Reduced attentional focus (RED) - tendency to make mistakes because attention is narrowed too much, thereby excluding task-relevant information (Nideffer, 1976b).

In summary, the TAIS attentional scales appeared to be particularity useful if one is interested in the breadth of attention from broad to narrow, or in detecting which athletes may lack the ability to concentrate because they are overloaded and reduce attention too much.

TAIS and Performance of Athletes

These attentional scales have been used with athletes from several sports to test various predictions. The

general logic for such predictions have been outlined by Van
Schoych and Grasha (1981): As a general rule, as situations
become more complex and change rapidly, a participant will
need an externally focused attentional style. Thus a
linebacker in football would need a broad external focus due
to the complexity of the game, whereas a tennis or baseball
batter would utilize a narrow focus to perform well.
Conversely, as the demand for analysis or planning
increased, the need for internal and reflective attentional
style became apparent. Thus, a weight lifter or shot putter
would need a relatively narrow internal focus, where a
quarterback in football determining what play to call would
need a broad internal focus.

The empirical evidence (Nideffer, 1976a; Landers &
Courte, 1981: Landers, Furst, & Daniels, 1981) suggests that
attentional differences seem to exist between good and poor
performers. For instance, Nideffer (1976a) reported that
poor swimmers are overloaded by external and internal
stimuli (high OET and OIT, respectively) relative to good
swimmers. Similarly, Landers, Furst, & Daniels (1981) found
that poor shooters (rifle, pistol, skeet, and trap) are
overloaded by external stimuli (OET) and display an overly
reduced focus of attention (RED) relative to good shooters.
Thus, meaningful relationships between performance and
attentional styles, as measured by TAIS, appear to exist.

A variety of sport and motor performance related investigations have been conducted using the TAIS. Nideffer (1976a) used the TAIS to assess swimmers attentional styles as it related to the coaches end of the year performance evaluation of each of the swimmers. Inconsistent swimmers tended to become overloaded with external (OET) and internal (OIT) stimuli, failed to integrate thoughts and ideas and were unable to effectively narrow attention when necessary. Swimmers scoring high on the reduced attentional scale (RED) were rated by the coach as choking under pressure.

The majority of the evidence supporting the predictive validity of Nideffer's attentional scales have been correlational in nature (Landers, 1880). For example, Nideffer (1976b) reported that swimmers who were categorized as being inconsistent in their performance by their coach were overloaded with external and internal stimuli. Similarly, Landers and Courtet (1979) found shooters who believed they were able to effectively integrate ideas and information from many different areas (BIT) had more accurate performance scores.

The relationship of anxiety to Nideffer's attentional scales were examined by Landers, Furst, and Daniels (1981). The TAIS and Spielberger's trait anxiety (A-trait) scale was administered to 277 rifle, pistol, skeet, and trap shooters. The subjects were classified into closed (rifle/pistol) and

open (skeet/trap) skill activities. In addition, each of
these groups were subdivided according to their level of
ability. Landers, Furst, and Daniels (1981) assumed to find
differences with the skeet/trap shooters being more
extroverted and while also having a more externally focused
attentional style (BET) than rifle/pistol shooters. In
general this was found in the results. Skeet/trap shooters
were .50 to 1.00 standard deviations above rifle/pistol
shooters. This difference was also found on the BIT scale
as well.

Among open and closed skill shooters, high A-trait
athletes were at least a full standard deviation higher on
the overload and RED scales than low A-trait athletes. It
appeared that low A-trait shooters, who were generally the
better shooters, were able to control the focus of their
attention and had the ability to concentrate without
reducing their attention so much that they excluded task
relevant cues.

In a more comprehensive study, Van Schoyck and Grasha
(1981) compared the TAIS to a sport-specific scale (T-TAIS)
to examine beginning, intermediate, and advanced tennis
players. They found that the modified measure was more
accurate and valid. Of particular importance was their
evidence from both the TAIS and T-TAIS, which failed to
support Nideffer's contention that bandwidth of attention
was a bipolar continuum extending from a relatively narrow

to a broad orientation of information. They did not find that Nideffer's direction of attention (internal-external) was a strong factor among the tennis players tested. Instead, bandwidth of attention (broad-narrow) was most important.

Attempts have been made to discriminate successful from less successful athletes on the basis of their attentional style (Aronson, 1981; Jackson, 1980, Landers, Boutcher, & Wang, 1986; Zaichkowsky, Jackson, & Aronson, 1982). Evidence suggesting that the TAIS could discriminate such performers would support its predictive validity, but all of these studies were unable to discriminate successful from unsuccessful athletes and their performances using the TAIS.

Ford & Summers (1991) studied the used of the TAIS to discriminate between athletes of different skill levels. They divided their sample into three skill levels, advanced, intermediate and novice. The subjects for this study were 68 male cricket players, 84 fencers (48 males, 36 females) and 110 basketball players (61 males, 49 females). Ford and Summers (1991) then used factor analysis to establish 3 factors from the attentional subscales of the TAIS. Factor 1 loaded positively on the BET, BIT, and INFP subscales. This factor related to the ability to process and integrate many stimuli without making errors of underinclusion. Factor 2 loaded positively on the OET, OIT, and RED subscale. This pattern suggested poor attentional focus.

Factor 3 loaded positively on the NAR subscale which indicated the ability to effectively narrow attentional focus.

With regard to skill level, differences were obtained on two of the seven examined attentional subscales for the fencing group (Ford & Summers, 1991). The advanced fencers scored higher on the BET scale than the novice group. However, no difference was found between the intermediate group and the novice or advanced fencers. The novice fencers did score higher on the OET subscale than the average group, but no significant differences were found between the novice and advanced fencers on the OET scale. For the cricket players some success was found in predicting skill group by scoring individual attentional profiles. There were more effective attentional profiles for the advanced group than the two lower skilled groups.

Edwards, Pierce, and Winterowd (1996) compared three groups of intercollegiate athletes using selected TAIS subscales to screen for potential performance problems. One of the three groups consisted of athletes that had been referred (RFA) to the authors for performance enhancement services (n=23). The other two groups, nonreferred athletes (n-23), and nonathletes (n=23) were matched by gender and age with the subjects in the RFA group. Discriminant analysis was performed to compare the three groups. Two subscales, overloaded by internal stimuli (OIT) and narrow

attentional focus (NAR) were able to discriminate significantly among the three groups. Classification analysis revealed a correct classification of 61% of the subjects. In the second analysis between the RFA and NFA groups, a single subscale, OIT correctly classified 78% of the subjects. It was concluded that the TAIS, particularly the OIT subscale, could be used to effectively screen athletes for potential attention related performance problems.

TAIS and Other Applications

The TAIS has been used in a variety of settings. Nideffer (1976a) compared response differences on the 17 TAIS subscales of 74 male and 123 female introductory psychology students. The students took the TAIS to fulfill a course requirement. There were significant differences between male and females on five of the 17 TAIS subscales. Males scored higher on the broad-internal attentional focus (BIT), narrowing attention (NAR), physically oriented (P/O), and intellectually expressive (IEX). Females score higher on the expressive of positive affect (PAE) subscale.

An example of the TAIS's criterion-oriented validity was reported in a study used for the selection of police officers (Nideffer & Wiens, 1976). In this study it was found that the TAIS could be used to predict who would and who would not be selected for police training by an

experienced clinician. The clinician had been providing selection and screening services for a large metropolitan police department for over 12 years. During that time he had personally interviewed and made decisions on well over a 1000 applicants. The TAIS was a better predictor of selection than any other instrument used including the MMPI, the Strong Vocational Interest Blank, and the Wechsler Adult Intelligence Scale.

The relationship between the TAIS scores and an instructor's rating of student performance in a vocational counseling course at a small women's liberal arts college were examined by McPherson and Nideffer (1975). The TAIS was administered at the start of the course to see if attentional and interpersonal characteristics would be related to classroom performance. This course followed the Crystal and Bolles model that required students to write an extensive autobiography. Then students were to research an area they wanted to work in. Following this assignment, they were expected to be assertive and outgoing enough to make contact with community leaders in order to sell individuals on the fact that their services were needed. It was felt that certain individuals may have a great deal of difficulty following through with this model.

Following the last class the instructor, who was blind to the students scores on the TAIS, rated all the students on the college student appraisal form. Scores on these

items were then correlated with the TAIS results. There
were significant relationships between the TAIS scores and
class performance.

Additional evidence of the predictive validity of the
TAIS was found in the study of Eastman music students
referred to earlier. The TAIS was administered to incoming
students. These test scores were then rated to predict the
likelihood of problems developing because of:
(1) depression, (2) authority conflicts, (3) difficulty
concentrating, (4) lack of self-discipline, and (5)
performance anxiety. The incoming student group was then
divided into three groups based on their TAIS scores. From
the entire sample of 110, twenty-three students were
identified as being likely to be problem free. Twenty-two
students were grouped because it was felt they would be most
likely to experience problems. At the end of the academic
year the Dean of Students was asked to rate the two extreme
groups of students in terms of their actual behavior and
progress the two semesters.

Through the year some eight students were placed on
academic probation. Five of the eight were in the group
identified by the TAIS as being likely to have difficulty.
Those students in the extreme group who were predicted to
have authority conflicts did have significantly more
problems (peer complaints, Juvenile Board offenses, legal

problems, etc.) than students in the group designated as less likely to have problems.

Interestingly, this group with authority conflicts was also rated as superior in performance. Thus, they were indeed good students though they often got into trouble for believing so strongly in themselves. They had the "prima donna's" temperament. Finally, there was agreement between the Dean's assessment of students and the TAIS scores indicating depression.

Business executives' TAIS subscale scores were compared to a senior vice presidents rating of the executives on certain performance behaviors. The senior vice president rated the executives on certain behavior and these ratings were correlated with their TAIS scores for a group of 27 male business executives (Nideffer, 1981a, 1989). All executives were functioning at very high levels within a multi-national corporation. Most had master's degree in areas such as finance and business administration. It was hypothesized that the business executives would be more effective attentionally, would make fewer attentional errors, would describe themselves as more in control and have higher self-esteem.

The correlations ranged from .38 to .57 and indicated that the business executives who scored high on the BET and CON scales, while also scoring low on the INT scale were seen by their boss as, "Seeing when they are not making

their point and being able to shift to a new approach."
Executives who scored high on the BIT scale were seen as
"dealing effectively with complex situations." Individuals
who have a tendency to narrow their attentional focus too
much as indicated by the RED scale and scored high on the
OBS scale were identified as "becoming anxious and just
spinning their wheels." In addition, these executives react
to criticism by shutting down and not hearing what is said.

Nideffer (1981a, 1989) compared the Minnesota
Multiphasic personality Inventory (MMPI) profiles and the
TAIS profiles of a group of individuals who have been
arrested for extremely hostile and aggressive behavior.
Offenses ranged from rape, robbery, suicide, arson, and
attempted murder. There was an identifiable test profile
associated with these individuals on both the MMPI and the
TAIS. The subjects were confused, overloaded, angry,
impulsive, and had low levels of self-esteem. Scores tended
to be more extreme on the TAIS subscales for behavior
control and negative affect expression. The difference
between the two tests was that the TAIS profile tended to be
much more consistent across subjects.

Another study showed that psychiatric patients' TAIS
scores differed from nonpsychiatric patients' in terms of
attentional and interpersonal characteristics (DePalma &
Nideffer, 1976). This was consistent with the observed
differences between these groups in terms of their abilities

to function, make decisions, and to organize information. DePalma's study showed that psychiatric patients were more confused and overloaded (OET and OIT), less in control of interpersonal situations (CON), had lower levels of self-esteem (SES), were angrier (NAE), and were more likely to act out in impulsive and in antisocial ways (BCON).

Mind altering drugs like marijuana are seen as affecting attentional processes. Thus, response differences on the TAIS would be expected from individuals when they are "stoned" as opposed to when they were not. Under the influence of marijuana subjects demonstrated a breakdown in the ability to shift from an external attentional focus to an internal one. This results in the subjects becoming immersed in one particular style. This immersion results in temporal disturbances, errors of underinclusions, and a loss of some control in interpersonal situations (Nideffer, 1976).

Furst (1981) preselected subjects on attentional flexibility scores as measured by the RED and a flexibility scale from a slightly modified version of Etzel's Riflery Attention Questionnaire. The subjects performed a five-light task. They were asked to react to a five light panel by pushing the correct button that corresponded to a varying light pattern. It was hypothesized that subjects defined with flexible attentional styles would be quicker in switching their attention from central to peripheral tasks

and therefore would show a lesser reaction time (RT) decrement than subjects who found it more difficult to switch attention. There was no support for this hypothesis.

In another experiment Furst (1981) had the same subjects perform a two-choice RT task in which stimulus frequency was manipulated. It was shown that RT's for infrequent stimuli are longer. Thus it was hypothesized that subjects with an inflexible attentional style will have longer RT's to the infrequent stimuli than subjects who displayed a flexible attentional style. Again, this hypothesis was not supported.

Questionnaire measures of attention have been used with much greater success when the bandwidth of attention is the preselection measure. Reis and Bird (1981) used the BET and RED TAIS subscales to classify subjects according to broad and narrow attentional style. Then they had the extreme groups perform 16 trials on a pursuit rotor task, in which the subjects were asked to track a moving light, while simultaneously performing two peripheral probe tasks. As hypothesized, the broad attentional style subjects were better able to respond to the probes than those with a narrow attentional style. A second experiment with the same subjects showed that subjects with a broad attentional style who received positive feedback reacted faster to the probe than all other groups. If negative feedback created additional stress in these subjects, it would reduce the

range of cue utilization (Easterbrook, 1959) and thus
produce longer RT's to the peripheral probe. These findings
provide at least practical support for the predictive
validity of the bandwidth dimension of Nideffer's scale.

Summary

In summary, attention is a key component for
information processing, reaction time, and performance.
According to Nideffer (1976a, 1976b, 1981) individuals'
attention can be described by its width (narrow to broad)
and direction (internal to external). Effective individuals
maintain a balance between these two dimensions, shifting
from one to the other when the situation demands. If an
individual's "preferred attentional style" matches the
demands of the situation, a favorable performance outcome
will be more likely. If the individual fails to shift
attention when the demands of the task require, performance
will decline.

CHAPTER III

METHODS AND PROCEDURES

Subjects

Subjects for this study consisted of 120 NCAA Division
I athletes from a midwestern comprehensive university. The
sample was evenly divided by gender and type of sport. Of
the 60 females and 60 males, half participated on team
sports and the other half played individual sports. The
sports were selected and matched to be as similar as
possible for both male and females. The team sports
selected were baseball for males and softball for females.
The individual sports consisted of golf and track for both
genders.

Instrumentation

<u>TAIS Instrument</u>

Scientific criticism of previously existing personality
assessment instruments and the desire to objectively measure
and categorize individual attentional styles led Nideffer
(1976) to develop the self-report Test of Attentional and

Interpersonal Style (TAIS). On the basis of the theoretical
formulations of Shakow (1962), Cromwell (1968), and Nideffer
(1974), and the clinical observations of Frank (1961),
MacKinnon and Michels (1971), seventeen different aspects of
attentional and interpersonal behavior were identified.

On the basis of an item analysis by Nideffer (1976a),
144 TAIS items were placed into 17 subscales designed to
measure and provide information concerning the respondent's
ability to control various attentional factors that were
believed to be important in effective performance across
diverse situations. A sample of 302 undergraduates was used
to develop the 17 TAIS subscales. Each subscale item was
correlated with its total subscale score, correcting for the
items inclusion in the total score. Items that did not
exceed a probability of .01 were dropped.

Six of the 17 TAIS subscales (BET, OET, BIT, OIT, NAR,
RED) have been developed to provide an indication of the
individual's tendency to adopt either an appropriate or
inappropriate attentional focus. Nine of the subscales
(CON, SES, P/O, OBS, EXT, INT, IEX, NAE, PAE) describe how
an individual is most likely to behave in a variety of
interpersonal situations. The final two subscales (INFP,
BCON) are designed to provide information concerning one's
ability to exert behavioral and cognitive control in various
situations. For the purpose of this study, only the six
TAIS's attentional subscales were used.

Six TAIS's Attentional Subscales

Broad-External Focus of Attention (BET): This subscale indicates an awareness of one's environment and the ability to react appropriately to it. This is the type of attentional focus required in politics or sales in order to read and react to an audience or client. It is what police refer to as "street sense" or the ability of an open field runner needs in a sports setting. Often the people who score highest on this attentional scale are much more sensitive to the environment than they are to themselves. They are more concerned with reading and reacting to others, at times manipulating others, than they are with long term consequences or planning for the future.

Broad-Internal Attentional Focus (BIT): This is the type of attention needed to analyze, organize, anticipate and plan. It is the ability to recall information, mix it with what is going on and draw some logical conclusions. This ability is critical to effective intellectual functioning. Individuals with extremely high scores may not be as sensitive to their environment as they sometimes should be.

Narrow Attentional Focus (NAR): This score indicates evidence of one's ability to concentrate in a focused manner, to discipline oneself, to follow through, and to

avoid being distracted. Professional musicians tend to be very dedicated and score high on this scale.

Overloaded by External Stimuli (OET): This scale provides an indication of how easily a individual can become distracted by their environment. Often adolescents in serious trouble, subjects with learning disabilities, and those in legal difficulties because of impulsive hostile behavior tend to score high on this and the OIT scale.

Overloaded by Internal Stimuli (OIT): This scale indicates the tendency to become distracted by one's own thoughts, concerns, feelings, etc., especially when individuals are under stress.

Reduced Attentional Focus (RED); This scale reflects the tendency to reduce attention too much. This often results in decisions that are made without adequate information. Research has shown that high scorers on this scale in combination with OIT tend to choke and fall apart under pressure (Edwards, Pierce, Winterowd, 1996).

TAIS's Reliability

Reliability studies performed by Nideffer (1976) indicated that the TAIS can reasonably measure stable characteristics, and that different test interpreters can be taught to agree on how to use and interpret the test data. Two week reliability coefficients averaged .83. When a group of subjects were tested and then retested one year

later, the test-retest correlations averaged .76. These test-retest correlations are quite high and provide strong evidence that the TAIS is measuring some stable personality and perceptual characteristics or traits.

The TAIS test-retest reliability based on a two-week interval was studied for 90 introductory psychology students (45 males, 45 females). Correlations ranged from a low of .60 to .93 with a median of .83.

To assess the inter-rater reliability of the TAIS, raters were asked to make judgements based on the test scores as to likelihood that Eastman School of Music students would have problems due to (1) depression, (2) performance anixety, (3) a lack of self-discipline, (4) difficulty concentrating, and (5) authority conflicts. Inter-rater reliabilities ranged from .73 to .96 with the median being .86. These are high correlations and indicate that with trained raters the TAIS has excellent inter-rater reliability.

Validity of the TAIS

Several studies by Nideffer have provided strong evidence for the construct validity of the TAIS. The TAIS was developed on the assumption that the ability to develop four different types of attention would be critical to being able to perform effectively. TAIS scores have been used to predict which swimmers will choke under pressure.

Individual's scores have been found useful in predicting the ability of student job candidates to communicate effectively in job interviews. The scores of business executives have been found to correlate with the performance evaluations from their boss (Nideffer, 1976).

As an example, executives who scored high on the scales indicating that they are able to be attentive to many different things at once (BET and BIT), who are in control of interpersonal situations (CON), and who are not introverted (-INT), are described by the superior as "seeing when they are not making a point and being able to shift to a new approach, changing until they find one that works." In a similar way if executives scored high on the BIT subscale, this indicated that they are good at analyzing complex situations and their superior described them as being able to deal effectively with complex situations, where they must deal with and respond to several people at the same time.

In a more negative way, those executives who scored high on the scale indicating they are able to narrow their attention (NAR), and that they tend to worry about details without resolution (OBS) are seen as becoming anxious; superior's stated "they just start spinning their wheels, jumping from thought to thought without any connecting ties." In addition, they react to criticism by blocking out what is said. They become so defensive against the first

part of what is said that it is almost impossible to finish any further discussion.

Research has established the relationship between anxiety and attention (Landers, 1980). The fact that anxiety measures correlate with the TAIS attentional scales provides evidence of construct validity. As anxiety and arousal increase, attention narrows and NAR increases, overload scores increase (OET and OIT), and the individual begins to make errors of underinclusion because they fail to shift from an external focus of attention to an internal one or vice-versa (RED). These findings provide evidence for the construct validity of the TAIS and all of them are relevant to situations in which the desire is to provide information about performance abilities, especially performance under pressure. For this reason it is not surprising that the TAIS has found use in the selection of police, SWAT teams, and emergency service personnel. It is also being used in training with these people to help them function more effectively under pressure by identifying and preventing potential problems.

Data Collection

Data for this study was collected using Nideffer's Test of Attentional and Interpersonal Styles (TAIS) and a demographic sheet prepared by the researcher (Appendix B). Subjects were athletes from a midwestern NCAA Division I-A

school participating in the Big 12 conference. Head coaches were contacted personally by the researcher to obtain consent to include their athletes in this study. After permission was granted, testing times were arranged to accommodate the needs of the coaches and their team's schedule. The following arrangements were made with the participating coaches

1. Data collection for the baseball team was conducted before practice during preseason workouts at the teams' training facility. Testing was administrated by the investigator.

2. Copies of the test and testing instructions were left with the men's golf head coach. Testing was conducted at a convenient time by an assistant coach who was trained by the researcher. The completed test materials were returned to the researcher via campus mail.

3. The women's golf coach was contacted and arrangements were made for the testing to take place before a team meeting at the beginning of the golf season. The test was administered by the investigator.

4. The track coaches were contacted about including their athletes in this study. Upon their request, testing was performed on three separate occasions by the researcher at the track training facility before practice during the season.

Analysis of Data

A 2 X 2 analysis of variance design with a significance level of .05 was used to analyze the data using a microcomputer statistical package (SYSTAT). The dependent variables consisted of the six TAIS attentional subscales; Broad-external attentional focus (BET), Broad-internal attentional focus (BIT), Narrow attentional focus (NAR), Overloaded by external stimuli (OET), Overloaded by internal stimuli (OIT), and Reduced attentional focus (RED). The independent variables were the type of sport (team versus individual) and gender (male versus female).

CHAPTER IV

RESULTS AND DISCUSSION

Introduction

The purpose of this study was to examine whether the six attentional styles as measured by Nideffer's Test of Attentional and Interpersonal Style (TAIS) differ between NCAA Division I-A male and female athletes, and between those who participate in individual sports versus team sports. The six TAIS's attentional styles subscales were BET, BIT, OET, OIT, NAR, and RED.

The sample population consisted of NCAA Division I-A college athletes from the Big 12 Conference. The sample (refer TABLE I) included 120 subjects (60 females, 60 males)

TABLE I

TYPE OF SPORT BY GENDER

	Female (n=60)	Male (n=60)
Baseball/Softball	25.0%	25.0%
Track	18.3%	14.2%
Golf	6.7%	10.8%

from both team and individual sports. The sports were selected and matched to be as similar as possible for both male and female athletes. The team sports selected were baseball for males (n = 30), and softball for females (n = 30). The individual sports for males consisted of golf (n = 13), and track (n = 17). For females, the individual sports were also golf (n = 8) and track (n = 22).

TABLE II

COLLEGE CLASSIFICATION BY GENDER

	Female (n=60)	Male (n=60)
seniors	17	16
juniors	12	18
sophomores	6	15
freshman	23	11

Regarding the subjects' classification (refer TABLE II), there were 33 seniors (females = 17, males = 16), 30 juniors (females = 12, males = 18), 21 sophomores (females = 6, males = 15) and 34 freshman (females = 23, males = 11).

Testing Of Hypotheses

Analyses of Variance (ANOVA) were performed using a SYSTAT Program for the personal computer. The two

independent variables were gender (female, male) and the
type of sport the athletes participated in (team,
individual). The dependent variables were six selected TAIS
attentional subscales (BET, OET, BIT, OIT, NAR, RED). The
following hypotheses were tested at the 0.05 significant
level.

Hypothesis 1: There will be no significant difference
between athletes who participate in team sports versus
individual sports on the broad external (BET)
attentional focus subscale.

Hypothesis 2: There will be no significant difference
between female and male athletes on the broad external
(BET) attentional focus subscale.

Mean scores based on the type of sport for BET are
depicted in Figure 1. For individual sports, the overall
mean and standard deviation were 14.96, and 3.22
respectively. The mean and standard deviation for team
sports were 15.51 and 2.74 respectively. The overall means
based on gender for BET are shown in Figure 2. The mean was
15.30 with a standard deviation of 2.78 for females. Males
had a mean of 15.18 and standard deviation of 3.20.

TABLE III shows the means and standard deviations for
the BET subscale by type of sports and gender. Males
participating in individual sports achieved a mean of 14.80
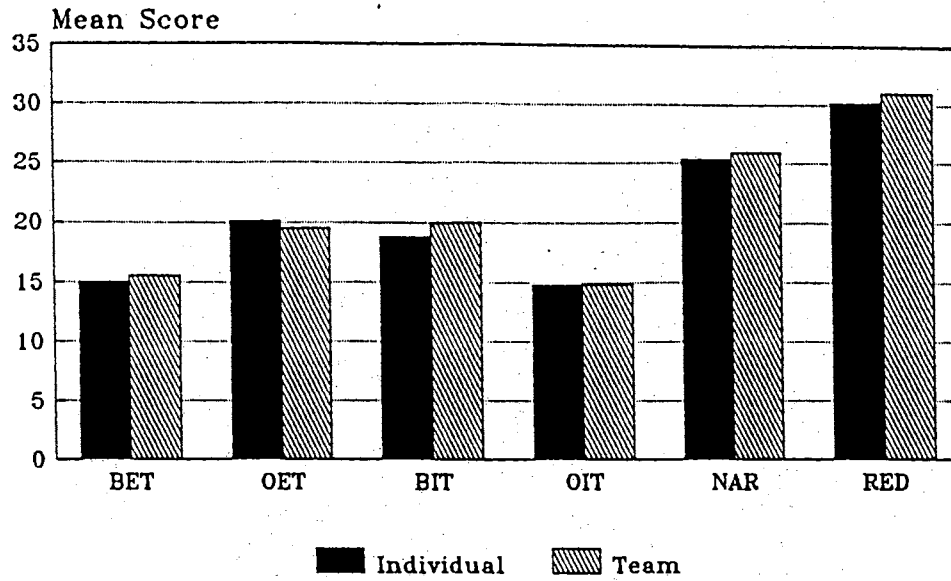
Figure 1. Mean Scores of Selected
TAIS Subscales By Type of Sports
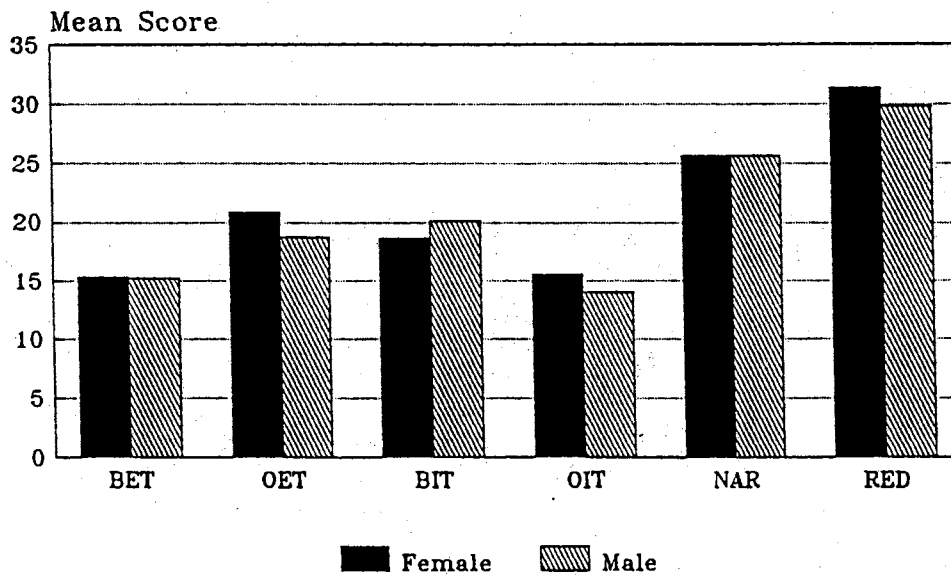
Figure 2. Mean Scores of Selected
TAIS Subscales By Gender

TABLE III

BROAD EXTERNAL SUBSCALE (BET)
BY GENDER AND TYPE OF SPORT

		Male	Female
Team	Mean	15.50	15.50
	s.d	3.03	2.47
Individual	Mean	14.80	15.10
	s.d.	3.38	3.10

with a standard deviation of 3.38, while females had a mean

of 15.10 and a standard deviation of 3.10. For team sports,

the means and standard deviations for males was 15.50, 3.03

and for females 15.50, 2.47 respectively.

The results of the data analysis showed that both the

main effects for type of sport and gender for BET were not

significant at the 0.05 level. No significant gender by

type of sports interaction was found. Therefore both

Hypotheses 1 and 2 were not rejected.

Hypothesis 3: There will be no significant difference
between athletes who participate in team sports versus
individual sports on the overloaded by external stimuli
(OET) subscale.

Hypothesis 4: There will be no significant difference between female and male athletes on the overloaded by external stimuli (OET) subscale.

The mean scores for OET based on the type of sport are shown in Figure 1. For individual sports, the mean and standard deviation were 20.11 and 5.72 respectively. The mean and standard deviation for team sports were 19.50 and 6.71 respectively. The overall means for OET based on gender are depicted in Figure 2. The mean was 20.86 with a standard deviation of 6.28 for females. Males had a mean of 18.75 with a standard deviation of 6.01.

Table IV shows the means and standard deviations for OET by gender and type of sport. For team sports, the mean and standard deviations were 21.80 and 6.97 for females, and 17.10, 5.61 for males. Males participating in individual sports achieved a mean of 20.30 with a standard deviation of 6.05, while females had a mean of 19.80 and a standard deviation of 5.45.

The results of a two-way ANOVA for the OET are shown in Table V. The main effects for type of sport and gender for OET were not significant at the 0.05 level. Therefore Hypotheses 3 and 4 were not rejected.

However, there was a significant gender by type of sports interaction ($F = 5.605$; df = 1, 116; $p < 0.05$) for the Overloaded Exteral (OET) subscale. A post hoc analysis revealed a significant difference between males and females

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TABLE IV

OVERLOAD EXTERNAL SUBSCALE (OET)
BY GENDER AND TYPE OF SPORT

		Male	Female
Team	Mean	17.10	21.80
	s.d	5.61	6.97
Individual	Mean	20.30	19.80
	s.d.	6.05	5.45

TABLE V

ANOVA SUMMARY FOR OVERLOAD
EXTERNAL SUBSCALE (OET)

Source	SS	df	MS	F	p
Gender	134.408	1	134.408	3.667	0.058
Type	11.408	1	11.408	0.311	0.578
G X T	205.408	1	205.408	5.605	0.020*
Error	4251.367	116	36.650		

* p < .05

for team sports (F = 8.384; df = 1, 58; p < 0.01), with females scoring higher than males. There was no significant differences between gender for those who played individual sports for the OET subscale.

Hypothesis 5: There will be no significant difference between athletes who participate in team sports versus individual sports on the broad internal (BIT) attentional focus subscale.

Hypothesis 6: There will be no significant difference between female and male athletes on the broad internal (BIT) attentional focus subscale.

The mean scores for BIT based on the type of sport are shown in Figure 1. For individual sports, the mean and standard deviation were 18.80, and 3.48 respectively. The mean and standard deviation for team sports were 19.96 and 3.21 respectively. Figure 2 depicts the overall mean scores for BIT based on gender. The mean was 18.61 with a standard deviation of 3.49 for females while males had a mean of 20.15 and standard deviation of 3.12.

Table VI shows the means and standard deviations for BIT by gender and type of sports. Males participating in individual sports had a mean of 19.70 with a standard deviation of 3.10, while females had a mean of 17.90 and a standard deviation of 3.66. For team sports the means and standard deviations for females were 19.30, 3.23, and for males 20.60, 3.12 respectively.

The two-way ANOVA results for the BIT subscale are presented in Table VII. The main effects for type of sport

TABLE VI

BROAD INTERNAL SUBSCALE (BIT) BY
GENDER AND TYPE OF SPORT

		Male	Female
Team	Mean	20.60	19.30
	s.d	3.12	3.23
Individual	Mean	19.70	17.90
	s.d.	3.10	3.66

TABLE VII

ANOVA SUMMARY FOR BIT

Source	SS	df	MS	F	p
Gender	70.533	1	70.533	6.520	0.012*
Type	40.833	1	40.833	3.775	0.054
G X T	2.133	1	2.133	0.197	0.658
Error	1254.867	116	10.818		

* p < .05

was not significant. Therefore, Hypothesis 5 was not

rejected. There was a significant main effect for gender

(F = 6.520; df = 1, 116; p < 0.05). Males scored higher

than females for both team and individual sports on the BIT.

Thus Hypothesis 6 was rejected. No significant gender by type of sport interaction was found.

Hypothesis 7: There will be no significant difference between athletes who participate in team sports verses individual sports on the overloaded by internal stimuli (OIT) subscale.

Hypothesis 8: There will be no significant difference between female and male athletes on the overloaded by internal stimuli (OIT) subscale.

The mean scores for the OIT subscale based on the type of sport are shown in Figure 1. For individual sports, the mean and standard deviation were 14.71, and 4.77 respectively. The mean and standard deviation for OIT based on team sports were 14.80 and 5.33 respectively. Figure 2 presents the overall means for OIT by gender. The mean was 15.53 with a standard deviation of 5.12 for females. Males had a mean of 13.98 and standard deviation of 4.87.

Table VIII presents the means and standard deviations for the OIT subscale by gender and type of sports. For individual sports, the mean for males was 14.50 with a standard deviations of 4.83, while females had a mean of 14.90 and a standard deviations of 4.78. For team sports, the means and standard deviations for females were 16.10, 5.44, and 13.40, 4.93 for males respectively.

TABLE VIII

OVERLOAD INTERNAL SUBSCALE (OIT) BY GENDER AND TYPE OF SPORT

		Male	Female
Team	Mean	13.40	16.10
	s.d	4.93	5.44
Individual	Mean	14.50	14.90
	s.d.	4.83	4.78

The results of the data analysis for the OIT subscale showed that both the main effects for type of sport and gender were not significant at the 0.05 level. Therefore Hypotheses 7 and 8 were not be rejected. Neither was there a significant gender X type of sport interaction.

Hypothesis 9: There will be no significant difference between athletes who participate in team sports versus individual sports on the narrow attentional (NAR) focus subscale.

Hypothesis 10: There will be no significant difference between female and male athletes on the narrow attentional (NAR) focus subscale.

Mean scores for the NAR subscale based on the type of sport are shown in Figure 1. For individual sports, the mean and standard deviations were 25.36, and 2.76 respectively. The mean and standard deviation for team sports were 25.95 and 3.28, respectively. Figure 2 shows the overall means for NAR by gender. The mean and standard deviations were 25.65 with a standard deviation of 2.76 for females. Males had a mean of 25.66 and standard deviation of 3.30.

TABLE IX

NARROW ATTENTIONAL SUBSCALE (NAR)
BY GENDER AND TYPE OF SPORT

		Male	Female
Team	Mean	26.10	25.70
	s.d	3.64	2.92
Individual	Mean	25.10	25.50
	s.d.	2.91	2.64

Table IX presents the means and standard deviations for NAR by gender and type of sports. Males participating in individual sports achieved a mean of 25.10 with a standard deviation of 2.91, while females had a mean of 25.50 and a standard deviation of 2.64. For team sports, the means and

standard deviations for females were 25.70, 2.92, and for males 26.10, 3.64 respectively.

Results of the data analysis showed that both the main effects for type of sport and gender for NAR were not significant at the 0.05 level. Therefore Hypotheses 9 and 10 were not rejected. There was no significant gender by type of sport interaction.

Hypothesis 11: There will be no significant difference between athletes who participate in team sports verses individual sports on the reduced attentional (RED) focus subscale.

Hypothesis 12: There will be no significant difference between female and male athletes on the reduced attentional (RED) focus subscale.

The mean scores for the RED subscale based on the type of sport are shown in Figure 1. For individual sports, the mean and standard deviation were 30.18, and 4.61 respectively. The mean and standard deviation for team sports were 31.03 and 3.71 respectively. Figure 2 shows the means for RED by gender. The mean score was 31.38 with a standard deviation of 4.01 for females. Males had a mean of 29.83 and standard deviation of 4.25.

Table X presents the means and standard deviations for RED by gender and type of sports. The data analysis

TABLE X

REDUCED ATTENTIONAL SUBSCALE (RED)
BY GENDER AND TYPE OF SPORT

		Male	Female
Team	Mean	30.40	31.60
	s.d	3.84	3.53
Individual	Mean	29.20	31.10
	s.d.	4.63	4.48

TABLE XI

ANOVA SUMMARY OF RED

Source	SS	df	MS	F p	
Gender	72.075	1	72.075	4.188	0.043*
Type	21.675	1	21.675	1.259	0.264
G X T	2.408	1	2.408	0.140	0.709
Error	1996.433	116	17.211		

* p < .05

results of a two-way ANOVA were depicted in Table XI. Males
participating in individual sports achieved a mean of 29.20
with a standard deviation of 4.63, while females had a mean
of 31.10 and a standard deviation of 3.53. For team sports,

the means and standard deviations for females were 31.60,

3.53, and for males 30.40, 3.84 respectively.

Data analysis revealed no significant main effects for type of sports on the RED subscale. Thus, Hypothesis 11 was not rejected. However, there was a significant main effect for gender ($F = 4.188$; $df = 1, 116$; $p < 0.05$) on the RED subscale. For the individual sports, females scored higher than males. This was also true for team sports. Thus Hypothesis 12 was rejected. There was no significant gender X type of sport interaction.

Discussion

On the broad external attentional focus subscale (BET), males athletes participating in individual sports (mean = 14.8) scored the lowest of any of the four groups. The other three groups scored very much the same on this subscale. This finding would seem to make sense based on the fact that athletes engaged in individual sports do not have to be as concerned with their teammates movements in terms of their own performance. Athletes playing on team sports scored higher on the BET subscale than athletes engaging in individual sports, regardless of gender. Therefore athletes on team sports have a better ability to integrate stimuli from their external world to improve performance.

In regard to being overloaded by an external stimuli, the OET subscale indicated that the athlete was taking in too much information from the external environment which decreases performance. For athletes playing team sports, females (mean = 21.8) scored significantly higher than males (mean = 14.8) on the OET overload subscale. This gender effect was reversed for individual sports with males (mean = 21.8) scoring higher than their female (mean = 19.8) counterparts.

In terms of the broad internal attentional focus subscale (BIT), the data revealed a difference based on gender. Males athletes scored higher on this subscale for both team and individual sports. This indicates that the male athletes tended to be able to focus their attention internally and handle more thought processes effectively in terms of athletic performance. This finding could be partly explained by the fact that male athletes typically have more opportunities to become involved in athletics at a younger age and thus develop their physical and mental skills to be able to maintain the proper attentional style based on the situation at hand.

Males on team sports scored the highest of the four groups. Again this finding would seem to be consistent with the fact that males can become involved in team sports at younger age than the females. Therefore, male athletes have a early advantage in developing the proper attentional

skills to improve performance when compared to females
athletes on team sport. When comparing athletes that
compete in individual sports, male athletes once again score
higher than their female counterparts on the BIT subscale.
It is interesting to note that athletes playing team sports
scored higher on the BIT subscale than those athletes
participating in individual sports for both males and
females. It would be understandable in terms of the team
sport athletes having to think ahead about their teammates
movements on the playing fields and anticipate those
movements to gain an performance advantage over their
opponent.

Female athletes scored higher on the overload subscale
(OIT) than male athletes regardless of the type of sport.
Females athletes who played team sports scored the highest
of any of the four groups. This indicates that they are
making performance errors due to their busy internal thought
processes and are thinking too much. They have lost the
ability to focus just on the task at hand and are creating
to much internal self talk that often leads to less than
ideal performances. Males playing team sports scored the
lowest of the four groups on the OIT subscale. This
indicates that they can maintain the proper attentional
style in terms of playing team sports.

Females and males in individual sports scored nearly
the same. It is interesting to note that males who play an

individual sports scored higher on this scale than males participating in team sports, with just the reverse for female athletes. Once again, indicating that the early exposure to team sports for males and individual sports for females (i.e. swimming, tennis, dance, gymnastics, etc.) helps prepare them physically and mentally for the demands of their chosen sport.

Athletes who play team sports scored higher on the NAR subscale than those who play individual sports regardless of gender. This indicated that team sport athletes have a better ability to narrow attentional focus when appropriate for the task at hand. Males playing team sports scored the highest on the NAR subscale while male athletes playing individual sports scored the lowest. This supports the idea that those athletes playing team sports need to have the ability to scan the situation and then narrow their attentional focus to perform the given task. This is a critical skill for athletes that participate in team sports to help elevate the play of their teammates. Theoretically, less exposure to team sports for females leads to inappropriate attentional styles compared to males who play in team sports.

Males participating in individual sports scored the lowest of the four groups on the RED subscale indicating that this group makes fewer mistakes due to reducing attention focus too much for the task at hand. Female athletes playing individual sports also scored lower on this

RED subscale than their female counterparts who play team sports. Again this supports the idea that those athletes who participate in individual sports have less trouble with reducing their attentional focus to the point of excluding relevant cues.

Overall, females who play teams sports scored the highest on both overload scales (OET, OIT) and the RED scale. This indicates that the female athletes playing team sports are both internally and externally overloaded and make the mistake from narrowing their attentional focus to exclude relevant cues and information needed to perform successfully. Female athletes participating in individual sports have a more external attentional focus than their male counterparts playing individual sports.

Males playing team sports score the highest on the BET, BIT and NAR scales indicating proper attentional focus. At the same time this group scored the lowest on both of the overload scales. This indicates that this group of athletes comes to the playing field with the best chances of success. Since this group has traditionally received the most attention in terms of programs and resource, these results are not surprising. Males athletes playing individual sports seem to make the least mistakes caused by reducing attention focus too much. However, this group was more overloaded (OIT, OET) than their male counterparts who play team sports.

CHAPTER V

SUMMARY, FINDINGS, CONCLUSIONS
AND RECOMMENDATIONS

Summary

The purpose of this study was to investigate the relationship between gender and type of sports (individual or team) of elite level college athletes' as measured by Nideffer's Test of Attentional and Interpersonal Style (TAIS). More specifically, this study was to examine whether attentional styles differ between NCAA Division 1-A male and female athletes and to discriminate between those that participate in individual sports versus team sports on the basis of the TAIS's six attentional subscales (BET, BIT, OET, OIT, NAR, RED).

Major Findings

1. Male and female athletes scored differently on the overload by external attentional (OET) focus subscale based on the type of sports they played. Female athletes who participated in team sports scored higher on the OET subscale than male athlete in team sports. However, male athletes who participated in individual sports scored higher on this subscale than their female counterparts who played individual sports.

2. Male athletes scored higher on the broad internal attentional (BIT) focus subscale than females for both team and individual sports.

3. Female athletes scored higher on the reduced attentional (RED) focus subscale than male athletes for both individual and team sports.

4. Athletes participating in team sports scored higher on the RED subscale than those athletes playing individual sports, regardless of gender.

5. Female athletes scored higher on the overloaded by internal attentional (OIT) focus than male athletes for both team and individual sports.

6. Athletes who participated in team sports scored higher on the narrow attentional (NAR) focus subscale than those athletes who participated in individual sports regardless of gender.

7. Those athletes that participated in team sports scored higher on the broad external attentional subscale (BET) than those who player individual sports regardless of gender.

8. Females who participated in individual sports scored higher on the broad external attentional subscale (BET) than males who participated in individual sports.

Conclusions

Female athletes who participated in team sports
displayed inappropriate attentional styles as indicated by
how they scored on both the internal and external overload
subscales. This group also is most likely to make mistakes
by narrowing their attention too much and to disregarding
relevant cues needed to have optimal performances.

Females need to have the opportunity to participate in
team sports at a younger age to develop the appropriate
attentional style. Traditionally, female team sports have
taken a back seat to team sports for males. Since the
passage of Title IX female team sports have grown and
developed.

The female athletes, particularly those that play team
sports are on the extreme side in terms of broadening or
reducing their attentional style. High scores on the OET
subscale indicated they tended to take in excessive
information from their outside world. Yet, when they narrow
their attentional focus they narrow it so much as to
exclude relevant cues and lessen performance. This is shown
by their high score on the RED subscale.

Males athletes have the attentional style that will
help them cope with pressure situations. This is indicated
by their higher scores on the BET, BIT and NAR subscale.
Male athletes who play individual sports are overloaded both
internally and externally when compared to male athletes who

play team sports. Individual sport athletes have the entire
performance pressure upon their shoulders without the
assistance of teammates to share in the blame of failure or
the reward of success.

Recommendations

Based on the finding of this study male and female
athletes have different attentional styles in terms of type
of sport they participate in. Female athletes who play on
team sports become overloaded both externally and internally
compared to their male counterparts on team sports. Female
athletes also make more mistakes due to reducing their
attentional focus too much. This means different coaching
styles need to be employed based on gender. When coaching
females, it is important to break down skills and strategies
and present them as building blocks to success. In this way
the female athletes are less likely to become overloaded
with information. In terms of game preparation, stress
levels should be kept low. Thus, the traditional pre-game
pep talk does not need to increase the amount of stress the
athletes are already under. Instead, providing a supportive
environment with clear goals and instructions should allow
the athletes to focus on the task at hand and assist in
performing at optimal levels.

Coaches may want to consider using the TAIS as a
assessment tool in the recruiting and selection process.
This would aid in identifying those athletes who would be

more likely to have performance problems based on the
overloaded subscales.

Proper coping skills for stress reduction should be
included in the athletes training regimen. Athletic
Directors, coaches, players and parents should understand
the importance of proper attentional training for optimal
performance. Progressive relaxation, visual imagery and
positive self-talk should be included in the athletes mental
training.

More opportunities for female athletes, especially team
sports should be provided in youth sport programs. This
would allow the female athlete to develop their physical
skills at a younger age. Once the basic skills have been
well developed more mental capacity can be devoted to the
mental side of the game. Thus by the time the female
athletes reach the college level they will be on par with
their male counterparts.

Finally, the following are recommendations for future
studies:

1. Replicate this study with elite athletes other than
NCAA Division I. Samples from Division II, Division III,
and NAIA schools should be used. Tracking the attentional
control of athletes from high school and junior colleges to
Division I schools could be carried out to determine
possible trends.

2. Replicate this study using a larger sample size and different team and individual sports. Other variables such as ethnicity and non-elite athletes should be included.

3. Coaches of elite high school and college athletes should consider training programs on attention control for female athletes as part of their preparation. More opportunities at all levels should be provided for female athletes to play on team sports at a younger age.

REFERENCE

Albrecht, R.R., & Feltz, D.L. (1987). Generality and
    specificity of attention related to competitive
    anxiety and sport performance. _Journal of Sport
    Psychology, 9_, 231-248.

Bacon, S. (1974). Arousal and the range of cue
    utilization. _Journal of Experimental Psychology, 102_,
    81-87.

Berlyne, D.E. (1970). Attention as a problem in behavior
    theory. In D.I. Mostofsky (Ed.), _Attention:
    Contemporary theory and analysis_ (pp. 25-49), New York:
    Appleton-Century-Crofts.

Broadbent, D.E. (1958). _Perception and communication._
    London: Pergamon Press.

Broadbent, D.E. (1979). Human performance and noise. In
    C.S. Harris (Ed.), _Handbook of noise control_ (2nd ed.)
    (pp 2066-2085). New York: McGraw-Hill.

Colley A., Roberts, N., & Chipps, A. (1985). Sex-role
    identity, personality, and participation in team and
    individual sorts by males and females. _International
    Journal of Sport Psychology, 13_, 31-42.

Cromwell, R.L. (1968). Stimulus redundancy and
    schizophrenia. _Journal of Nervous and Mental Disease,
    146_, 360-375.

DePalma, D.M., & Nideffer, R.M. (1977). Relationships
    between the test of attentional and interpersonal style
    and psychiatric subclassification. _Journal of
    Personality Assessment, 41_, 622-631.

Deutsch, J., & Deutsch, D. (1963). Attention: Some
    theoretical considerations. _Psychological Review,
    70_, 80-90.

Dewey D., Brawley, L.R., & Allard, F. (1989). Do the TAIS
    attentional scales predict how visual information is
    processed? _Journal of Sport Psychology, 11_, 171-186.

71

Easterbrook, J.A. (1959). The effect of emotion on cue utilization an the organization of behavior. <u>Psychological Review, 66</u>, 183-201.

Edwards, S.W., Pierce, D.E., & Wintercowd, C.L. (1996). <u>Screening athletes for potential performance problems</u>. Paper presented at the Annual Meeting of the American Psychological Association, Toronto, Canada, August, 1996.

Etzel Jr., E.F. (1979). Validation of a conceptual model characterizing attention among international rifle shooters. <u>Journal of Sport Psychology, 1</u>, 281-290.

Gopher, D., & Kahneman, D. (1971). Individual differences in attention and the prediction of flight criteria. <u>Perceptual and Motor Skills, 33</u>, 1335-1342.

Harger, G.J., & Raglin, J.S. (1994). Correspondence between actual and recalled precompetition anxiety in collegiate track and field athletes. <u>Journal of Sport and Exercise Psychology, 16</u>, 206-211.

Hatfield, B.D., Landers, D.M., & Ray W.J. (1984). Cognitive processes during self-paced motor performance: An electroencephalographic profile of skilled marksmen. <u>Journal of Sport Psychology, 6</u>, 42-59.

Hockey, G.R.J. (1970). Effect on loud noise on attentional selectivity. <u>Quarterly Journal of Experimental Psychology, 22</u>, 28-36.

Humphreys, G. (1981a). On varying the span of visual attention: Evidence for two modes of spatial attention. <u>Quarterly Journal of Experimental Psychology, 33A</u>, 17-31.

Jackson, D. (1971). The dynamics of structured personality test. <u>Psychologist Review, 78</u>, 229-248.

Keele, S.W. (1973). <u>Attention and human performance</u>. Pacific Palisades, CA. Goodyear.

Keele, S., & Hawkins, H. (1982). Exploration of individual differences relevant to high level skill. <u>Journal of Motor Behavior, 14</u>, 3-23.

Kleiber, D.A., & Hemmer, J.D. (1981). Sex differences in the relationship of locus of control and recreational sport participation. <u>Sex Roles, 7</u>, 801-810.

Landers, D. (1978). Motivation and performance: The role of arousal and attentional factors. In W. Straub (Ed.), Sport psychology: An analysis of athlete behavior (pp. 91-103), Ithaca, NY: Mouvement Publications.

Landers, D.M. (1980). The arousal-performance relationship revisited. Research Quarterly for Exercise and Sport, 51, 77-90.

Landers, D.M., & Courtet, P.A. (1979). Peripheral narrowing among experience and inexperienced rifle shooters under low and high stress conditions. Paper presented at the Annual Meeting of the North American Society for Psychology of Sport and Physical Activity, June 26-30, 1979, Trois-Rivieres, P.Q., Canada.

Landers, D.M., Furst, D.M., & Daniels, F.S. (1981). Anxiety/attention and shooting ability: Testing the predictive of the test of attentional and interpersonal style (TAIS). Paper presented at the Annual Meeting of the North American Society for the Psychology of Sport and Physical Activity, May 1981,Boulder, Co.

Lynn, R., Phelan, J., Kiker, V. (1969). Belief in internal-external control of reinforcement and participation in group and individual. Perceptual Motor Skills, 29, 551-553.

Maynard, I.W., & Howe, B.L. (1989). Attentional style in rugby players. Perceptual and Motor Skills, 69, 283-289.

McClelland, D. (1973). Testing for competence rather than intelligence. American Psychologist, 28, 1-14.

Miller, B., & Miller, A. (1985). Psychological correlates of success in elite sportswomen. International Journal of Sport Psychology, 16, 289-296.

Morgan, W.P. (1980). The trait psychology controversy. Research Quarterly for Exercise and Sport, 51, 50-76.

Nettleton, B., Shoulder, J., & Smith, R. (1984). Analysis of visual functioning in fast ball team games. Journal of Sports Medicine, 24, 327-336.

Nettleton, B. (1986). Flexibility of attention and elite athletes' performance in fast-ball games. Perceptual and Motor Skills, 63, 991-994.

Nideffer, R.M. (1976a). Test of attentional and interpersonal style. Journal of Personality and Social Psychology, 34, 3, 394-404.

Nideffer, R.M. (1976b). The inner athlete: Mind plus
     muscle for winning, New York: T.Y. Crowell.

Nideffer, R.M. (1976c). An interpreter's manual for the
     test of attentional and interpersonal style.
     Rochester, NY: Behavioral Research Applications Group.

Nideffer, R.M. (1977). A comparison of self-report and
     performance measures of attention: A second look.
     Journal of Perceptual and Motor Skills, 45, 1291-1294.

Nideffer, R.M. (1978). The relationship of attention and
     anxiety to performance. In W.F. Straub (Ed.), Sport
     psychology: An analysis of athlete behavior. Ithaca,
     NY: Mouvement Publications.

Nideffer, R.M. (1981). The ethics and practice of applied
     sport psychology. Ithaca, NY: Mouvement Publications.

Nideffer, R.M., & Wiens, A.N. (1976). A comparison of the
     psychometric characteristics of individuals accepted
     vs. those rejected for police training. Paper
     presented at the Western Psychological Association
     Meetings, Los Angeles.

Nougier, V., Ripoll, H., & Stein, J.F. (1989). Orienting
     of attention with highly skilled athletes.
     International Journal of Sport Psychology, 20, 205-223.

Nougier, V., Stein, J.F., & Azemar, G. (1990). Court
     orienting of attention and motor preparation processes
     in fencing. Journal of Human Movement Studies, 19,
     251-272.

Nougier, V., Stein, J.F., & Bonnel, A.M. (1991). Information
     processing in sport and orienting of attentions.
     International Journal of Sport Psychology, 22, 307-327.

Posner, M.I. (1980). Orienting of attention. Quarterly
     Journal of Experimental Psychology, 32, 3-25.

Reis, J., & Bird, A.M. (1982). Cue processing as a
     function of breadth of attention. Journal of Sport
     Psychology, 4, 64-72.

Shakow, D. (1962). Segmental set. Archives of General
     Psychiatry, 6. 1-17.

Silverman, J. (1964). The problem of attention in research
     and theory in scizophrenia. Psychological Review, 71,
     352-379.

Singer, R.N., Cauraugh, J.H., Tennant, K., Murphey, M., Chen, D., & Lidor, R. (1991). Attention and distractors: Considerations for enhancing sports performance. International Journal of Sports Psychology, 22, 95-114.

Starkes, J., & Allard, F. (1983). Perception in volley-ball: the effects of competitve stress. Journal of Sport Psychology, 5, 189-196.

Summers, J.J., & Maddocks, D. (1986). Attentional style profiles and sport performance. Behavior Change, 3, 105-111.

Summers, J.J., & Ford, S.K. (1990). The test of attentional and interpersonal style: An evaluation. International Journal of Sport Psychology, 21, 102-111.

Treismann, A., & Gelade G. (1980). A feature integration theory of attention. Cognitive Psychology, 12, 97-136.

Vallerand, R.J. (1983). Attention and decision making: a test of the predictive validity of the test of attentional and interpersonal style (TAIS) in a sport setting. Journal of Sport Psychology, 5, 449-459.

Van Schoych, S.R. & Grasha, A.F. (1981). Attentional style and athletic ability: The advantages of a sport-specific Test. Journal of Sport Psychology, 3, 149-165.

Wachtel, P. (1967). Conceptions of broad and narrow attention. Psychological Bulletin, 68, 417-429.

Wallace, J. (1966). An abilities conception of personality. American Psychologist, 21, 132-138.

Zaichkowsky, L.D. (1984). Attentional style. In W.F. Straub, & J.M. Williams (Eds.), Cognitive sport psychology (pp. 140-150). Lansing, NY: Sport Science Associates.

Zaichowsky, L., Jackson, C., & Aronson, R. (1982). Attentional/ and interpersonal factors as predictors of elite athletic performance. In T. Orlick, & J. Partington (Eds.), Mental training (pp. 103-104), Champaign, IL: Human Kinetics.

APPENDIXES

APPENDIX A

INSTITUTIONAL REVIEW BOARD

OKLAHOMA STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD
HUMAN SUBJECTS REVIEW

Date: 03-21-96   IRB#: ED-96-093

Proposal Title: THE ATTENTIONAL STYLE OF INTERCOLLEGIATE ATHLETES
BASED ON GENDER AND TYPE OF SPORT

Principal Investigator(s): Steven W. Edwards, Danny Pierce

Reviewed and Processed as: Exempt

Approval Status Recommended by Reviewer(s): Approved with Provisions

ALL APPROVALS MAY BE SUBJECT TO REVIEW BY FULL INSTITUTIONAL REVIEW BOARD
AT NEXT MEETING.
APPROVAL STATUS PERIOD VALID FOR ONE CALENDAR YEAR AFTER WHICH A
CONTINUATION OR RENEWAL REQUEST IS REQUIRED TO BE SUBMITTED FOR BOARD
APPROVAL.
ANY MODIFICATIONS TO APPROVED PROJECT MUST ALSO BE SUBMITTED FOR
APPROVAL.

Comments, Modifications/Conditions for Approval or Reasons for Deferral or Disapproval
are as follows:

PROVISIONS REQUESTED:

Please send a copy of the oral soliciation script or written solicitation that will be used prior
to subject participation Thank you.

· PLEASE DO NOT PROCEED WITH THIS STUDY PRIOR
TO RECEIVING FINAL APPROVAL.

If you have any strong disagreements with the reviewer's recommendations, you may
respond in writing to the executive secretary (Jennifer Moore, 305 Whitehurst, 744-5700)
or request a meeting with the full IRB to discuss the recommendations.

Signature: Date: April 2, 1996

Chair of Institutional Review Board

APPENDIX B

DEMOGRAPHIC DATA

DEMOGRAPHIC DATA

1. Gender:

_____ Male
_____ Female

2. Age:
_____ years old

3. Are you currently a varsity athlete ?

_____ yes
_____ no

4. Which type of school are you currently attending ?

_____ 4 year college
_____ 2 year college
_____ high school

5. Current classification:

_____ Freshman
_____ So.
_____ Jr.
_____ Sr.
_____ Graduate

6. Ethnicity:

_____ Caucasian
_____ Africa-American
_____ Asian-American
_____ Hispanic
_____ Native American
_____ Other, please specify _____

7. Sport:

_____ Baseball
_____ Basketball
_____ Football
_____ Golf
_____ Rugby
_____ Soccer
_____ Softball
_____ Tennis
_____ Track & Field
_____ Volleyball
_____ Wrestling
_____ Other, please specify _____

8. Is the sport you play currently in season?
   _____ yes
   _____ no

9. What position(s), event(s) or weight(s) do you normally participate in? _____

10. How often to you start in your sport?

    _____ every time
    _____ most of the time
    _____ sometimes
    _____ rarely
    _____ never

11. In the last two(2) years, have you had an injury that has caused you to miss playing time?

    _____ yes
    _____ no

12. If yes, please specify what type of injury you had:_____
    _____
    _____

13. How long has it been sense you substained the injury?

    _____ 3 months
    _____ 6 months
    _____ 12 months
    _____ 1-2 years

14. In the last two(2) years, have you had a major family emergency

    _____ yes
    _____ no

15. If yes, how long has it been since that family emergency?

    _____ 3 months
    _____ 6 months
    _____ 12 months
    _____ 1-2 years

16. How would you assess your current psychologic condition? (i.e. how are you feeling right now?)

    _____ I feel better than normal
    _____ I feel about normal
    _____ I feel worst than normal

APPENDIX C

TEST OF ATTENTIONAL AND
INTERPERSONAL STYLE

	NEVER	RARELY	SOMETIMES	FREQUENTLY	ALL THE TIME
1. When people talk to me I find myself distracted by the sights and sounds around me.	☐	☐	☐	☐	☐
2. When people talk to me I find myself distracted by my own thoughts and ideas.	☐	☐	☐	☐	☐
3. All I need is a little information and I can come up with a large number of ideas.	☐	☐	☐	☐	☐
4. My thoughts are limited to the objects and people in my immediate surroundings.	☐	☐	☐	☐	☐
5. I need to have all the information before I say or do anything.	☐	☐	☐	☐	☐
6. The work I do is focused and narrow, proceeding in a logical fashion.	☐	☐	☐	☐	☐
7. I run back and forth from task to task.	☐	☐	☐	☐	☐
8. I seem to work in "fits and starts" or "bits and pieces".	☐	☐	☐	☐	☐
9. The work I do involves a wide variety of seemingly unrelated material and ideas.	☐	☐	☐	☐	☐
10. My thoughts and associations come so rapidly I can't keep up with them.	☐	☐	☐	☐	☐
11. The world seems to be a booming buzzing brilliant flash of color and confusion.	☐	☐	☐	☐	☐
12. When I make a mistake it is because I did not wait to get all of the information.	☐	☐	☐	☐	☐
13. When I make a mistake it is because I waited too long and got too much information.	☐	☐	☐	☐	☐
14. When I read it is easy to block out everything but the book.	☐	☐	☐	☐	☐
15. I focus on one small part of what a person says and miss the total message.	☐	☐	☐	☐	☐
16. In school I failed to wait for the teachers' instructions.	☐	☐	☐	☐	☐
17. I have difficulty clearing my mind of a single thought or idea.	☐	☐	☐	☐	☐
18. I think about one thing at a time.	☐	☐	☐	☐	☐
19. I get caught up in my thoughts and become oblivious to what is going on around me.	☐	☐	☐	☐	☐
20. I theorize and philosophize.	☐	☐	☐	☐	☐
21. I enjoy quiet, thoughtful times.	☐	☐	☐	☐	☐
22. I would rather be feeling and experiencing the world than my own thoughts.	☐	☐	☐	☐	☐
23. My environment is exciting and keeps me involved.	☐	☐	☐	☐	☐
24. My interests are broader than most people's.	☐	☐	☐	☐	☐

	NEVER	RARELY	SOMETIMES	FREQUENTLY	ALL THE TIME
25. My interests are narrower than most people's.	☐	☐	☐	☐	☐
26. It is easy for me to direct my attention and focus narrowly on something.	☐	☐	☐	☐	☐
27. It is easy for me to focus on a number of things at the same time.	☐	☐	☐	☐	☐
28. It is easy for me to keep thoughts from interfering with something I am watching or listening to.	☐	☐	☐	☐	☐
29. It is easy for me to keep sights and sounds from interfering with my thoughts.	☐	☐	☐	☐	☐
30. Happenings or objects grab my attention.	☐	☐	☐	☐	☐
31. It is easy for me to keep my mind on a single thought or idea.	☐	☐	☐	☐	☐
32. I am good at picking a voice or instrument out of a piece of music that I am listening to.	☐	☐	☐	☐	☐
33. With so much going on around me, it's difficult for me to think about anything for any length of time.	☐	☐	☐	☐	☐
34. I am good at quickly analyzing complex situations around me, such as how a play is developing in football or which of four or five kids started a fight.	☐	☐	☐	☐	☐
35. At stores I am faced with so many choices I can't make up my mind.	☐	☐	☐	☐	☐
36. I spend a great deal of my time thinking about all kinds of ideas I have.	☐	☐	☐	☐	☐
37. I figure out how to respond to others by imagining myself in their situation.	☐	☐	☐	☐	☐
38. In school I would become distracted and didn't stick to the subject.	☐	☐	☐	☐	☐
39. When I get anxious or nervous my attention becomes narrow and I fail to see important things that are going on around me.	☐	☐	☐	☐	☐
40. Even though I am not hungry, if something I like is placed in front of me, I'll eat it.	☐	☐	☐	☐	☐
41. I am more of a doing kind of person than a thinking one.	☐	☐	☐	☐	☐
42. In a room filled with children or out on a playing field, I know what everyone is doing.	☐	☐	☐	☐	☐
43. It is easy for me to keep my mind on a single sight or sound.	☐	☐	☐	☐	☐
44. I am good at rapidly scanning crowds and picking out a particular person or face.	☐	☐	☐	☐	☐
45. I have difficulty shifting back and forth from one conversation to another.	☐	☐	☐	☐	☐
46. I get confused trying to watch activities such as a football game or circus where a number of things are happening at the same time.	☐	☐	☐	☐	☐
47. I have so many things on my mind that I become confused and forgetful.	☐	☐	☐	☐	☐
48. On essay tests my answers are (were) too narrow and don't cover the topic.	☐	☐	☐	☐	☐

	NEVER	RARELY	SOMETIMES	FREQUENT	ALL THE TI.
49. It is easy for me to forget about problems by watching a good movie or by listening to music.	☐	☐	☐	☐	☐ .
50. I can't resist temptation when it is right in front of me.	☐	☐	☐	☐	☐
51. In games I make mistakes because I am watching what one person does and forget about the others.	☐	☐	☐	☐	☐
52. I can plan several moves ahead in complicated games like bridge and chess.	☐	☐	☐	☐	☐
53. In school I was not a "thinker".	☐	☐	☐	☐	☐ ·
54. In a roomful of people I can keep track of several conversations at the same time.	☐	☐	☐	☐	☐
55. I have difficulty telling how others feel by watching them and listening to them talk.	☐	☐	☐	☐	☐
56. People have to repeat things to me because I become distracted by irrelevant sights or sounds around me.	☐	☐	☐	☐	☐
57. I make mistakes because I try to do too many things at once.	☐	☐	☐	☐	☐
58. I am good at analyzing situations and predicting in advance what others will do.	☐	☐	☐	☐	☐
59. On essay tests my answers are (were) too broad, bringing in irrelevant information.	☐	☐	☐	☐	☐
60. People fool me because I don't bother to analyze the things that they say; I take them at face value.	☐	☐	☐	☐	☐
61. I would much rather be doing something than just sitting around thinking.	☐	☐	☐	☐	☐
62. I make mistakes because my thoughts got stuck on one idea or feeling.	☐	☐	☐	☐	☐
63. I am constantly analyzing people and situations.	☐	☐	☐	☐	☐
64. I get confused at busy intersections.	☐	☐	☐	☐	☐
65. I am good at glancing at a large area and quickly picking out several objects, such as in those hidden figure drawings in children's magazines.	☐	☐	☐	☐	· ☐
66. I get anxious and block out everything on tests.	☐	☐	☐	☐	☐
67. Even when I am involved in a game or sport, my mind is going a mile a minute.	☐	☐	☐	☐	☐
68. I can figure out how to respond to others just by looking at them.	☐	☐	☐	☐	☐
69. I have a tendency to get involved in a conversation and forget important things like a pot on the stove, or like leaving the motor running on the car.	☐	☐	☐	☐	☐
70. It is easy for me to bring together ideas from a number of different areas.	☐	☐	☐	☐	☐
71. Sometimes lights and sounds come at me so rapidly they make me lightheaded or dizzy.	☐	☐	☐	☐	☐
72. People have to repeat things because I get distracted by my own irrelevant thoughts.	☐	☐	☐	☐	☐

	NEVER	RARELY	SOMETIMES	FREQUENT	ALL THE T
73. People pull the wool over my eyes because I fail to see when they are obviously kidding by looking at the way they are smiling or listening to their joking tone.	☐	☐	☐	☐	☐
74. I can spend a lot of time just looking at things with my mind almost a complete blank except for reflecting the things that I see.	☐	☐	☐	☐	☐
75. I sometimes confuse others because I tell them too many things at once.	☐	☐	☐	☐	☐
76. I engage in physical activity.	☐	☐	☐	☐	☐
77. People describe me as serious.	☐	☐	☐	☐	☐
78. I sit alone listening to music.	☐	☐	☐	☐	☐
79. People take advantage of me.	☐	☐	☐	☐	☐
80. I keep my thoughts to myself.	☐	☐	☐	☐	☐
81. I keep my feelings to myself.	☐	☐	☐	☐	☐
82. I am good at getting my own way.	☐	☐	☐	☐	☐
83. I like to argue.	☐	☐	☐	☐	☐
84. Others see me as a loner.	☐	☐	☐	☐	☐
85. I talked a lot in class when I was in school.	☐	☐	☐	☐	☐
86. I enjoy intellectual competition with others.	☐	☐	☐	☐	☐
87. I enjoy individual athletic competition.	☐	☐	☐	☐	☐
88. I compete(d) athletically.	☐	☐	☐	☐	☐
89. I physically express my feelings of affection.	☐	☐	☐	☐	☐
90. I compete with myself intellectually.	☐	☐	☐	☐	☐
91. I compete with myself physically.	☐	☐	☐	☐	☐
92. I enjoy activities with danger or an element of the unknown in them.	☐	☐	☐	☐	☐
93. I express my opinions on issues.	☐	☐	☐	☐	☐
94. I can keep a secret.	☐	☐	☐	☐	☐
95. When I believe deeply in something I find I am a poor loser and unable to compromise.	☐	☐	☐	☐	☐
96. I am socially self-confident when interacting with those who are like myself.	☐	☐	☐	☐	☐

	NEVER	RARELY	SOMETIMES	FREQUENTLY	ALL THE TIME
97. I am socially self-confident when interacting with authority figures.	☐	☐	☐	☐	☐
98. I am socially self-confident when talking in front of large groups.	☐	☐	☐	☐	☐
99. I am socially self-confident when talking with the opposite sex.	☐	☐	☐	☐	☐
100. I express my anger.	☐	☐	☐	☐	☐
101. I dated in high school.	☐	☐	☐	☐	☐
102. People think I am a clown.	☐	☐	☐	☐	☐
103. I get mad and express it.	☐	☐	☐	☐	☐
104. I get down on myself.	☐	☐	☐	☐	☐
105. I was one of the smartest kids in school.	☐	☐	☐	☐	☐
106. I am a good person.	☐	☐	☐	☐	☐
107. My feelings are intense.	☐	☐	☐	☐	☐
108. I need to help others.	☐	☐	☐	☐	☐
109. I need to be liked.	☐	☐	☐	☐	☐
110. I enjoy planning for the future.	☐	☐	☐	☐	☐
111. I wish I lived in a different time.	☐	☐	☐	☐	☐
112. I feel guilty.	☐	☐	☐	☐	☐
113. I feel ashamed.	☐	☐	☐	☐	☐
114. I am seen as a cold person by others.	☐	☐	☐	☐	☐
115. I am a good mixer.	☐	☐	☐	☐	☐
116. I am socially outgoing.	☐	☐	☐	☐	☐
117. I have difficulty waiting for good things to happen.	☐	☐	☐	☐	☐
118. I peeked at Christmas time.	☐	☐	☐	☐	☐
119. When I am angry I lose control and say things that sometimes hurt others.	☐	☐	☐	☐	☐
120. I have been angry enough that I physically hurt someone.	☐	☐	☐	☐	☐

	NEVER	RARELY	SOMETIMES	FREQUENTLY	ALL THE TIME
121. At dances or parties I find a corner and avoid the limelight.	☐	☐	☐	☐	☐
122. I acted in dramatic productions in high school and/or college.	☐	☐	☐	☐	☐
123. In school the kids I hung around with were athletes.	☐	☐	☐	☐	☐
124. In school the kids I hung around with were intellectuals.	☐	☐	☐	☐	☐
125. In school the kids I hung around with were popular.	☐	☐	☐	☐	☐
126. In school the kids I hung around with were outcasts or loners.	☐	☐	☐	☐	☐
127. People trust me with their secrets.	☐	☐	☐	☐	☐
128. I am in control of interpersonal situations.	☐	☐	☐	☐	☐
129. I fought in school.	☐	☐	☐	☐	☐
130. I have used illegal drugs.	☐	☐	☐	☐	☐
131. In groups I am one of the leaders.	☐	☐	☐	☐	☐
132. People admire me for my intellect.	☐	☐	☐	☐	☐
133. People admire me for my physical ability.	☐	☐	☐	☐	☐
134. People admire me for my concern for others.	☐	☐	☐	☐	☐
135. People admire me for my social status.	☐	☐	☐	☐	☐
136. I ran for class offices in school.	☐	☐	☐	☐	☐
137. I feel as though I am a burden to others.	☐	☐	☐	☐	☐
138. People see me as an angry person.	☐	☐	☐	☐	☐
139. I see myself as an angry person.	☐	☐	☐	☐	☐
140. I have a lot of energy for my age.	☐	☐	☐	☐	☐
141. I am always on the go.	☐	☐	☐	☐	☐
142. I cut school in high school.	☐	☐	☐	☐	☐
143. I have engaged in activities that could get me in trouble with the police.	☐	☐	☐	☐	☐
144. I guess you could call me a poor loser.	☐	☐	☐	☐	☐

APPENDIX D

TAIS PROFILE SHEET

Name _____ Age _____ Date _____

Sex _____

Standard Norm Group

Z Scores		Attentional						Control						Interpersonal					T Scores
	BET	OET	BIT	OIT	NAR	RED	INFP	BCON	CON	SES	P/O	OBS	EXT	INT	IEX	NAE	PAE	
4·0		36			41	43	68	37	65	43			50			28	36	90
	24	35	32	27	40	42	88	36	84	42		23	48	39		27		
		34	31	28	39	41	85	35	82	41			47	38	32		34	
	23	33		25	38	40	84	34	81	40		22	46	37		26	33	
		32	30		37	39	83	33	60	39			45	36	31	25	32	
3·0	22	31	29	24	36	38	61		50	38		21	44	35	30	24		80
	21	30	28	23	35		60	32	58	37			43	34	29	23	31	
		29			34	37	59	31	57	35		20	42		28	22	30	
	20	28	27	22	33	36	58	30	56	34	28		41	33			29	
		27	26	21		35	58	29	54	33	27		40	32	27	21	28	
2·0	10	26			33	34	66	28	53	32	26	10	38	31	26	20		70
		25	25	20	31	33	54		52	31	25		37	30	25	19	27	
	18	24	24	19	30	32	53	27	51	30	24	18	36	29	24	18	26	
				18	29	31	51	28	50	29	23		35	28			25	
	17	23	23		28	30	50	25	49	28	22	17	34		23	17		
1·0		22	22	17	27	29	49	24	47	27	21		33	27	22	16	24	60
	16	21	21	18	26		48	23	46	26	20	16	32	26	21	15	23	
		20			25	28	46	22	45	25	19		31	25	20	14	22	
	15	19	20	15	24	27	45		44	24	18	15	29	24		13	21	
		18	19	14	23	26	44	21	43	22	17		28	23	19			
0·0	14	17			23	25	43	20	42	21	16	14	27	22	18	12	20	50
		18	18	13	21	24	41	19	40	20	15		26	21	17	11	19	
	13	15	17	12	20	23	40	18	39	19			25		16	10	18	
		14		11	19	22	39	17	38	18	14	13	24	20		9	17	
	12	13	16		18	21	38		37	17	13		23	19	15			
1·0		12	15	10	17	20	37	16	36	16	12	12	22	18	14	8	15	40
	11	11	14	9			35	15	35	15	11		20	17	13	7	15	
		10			18	19	34	14	33	14	10	11	19	16	12	6	14	
	10	9	13	8	15	18	33	13	32	13	9		18	15		5		
	9	8	12	7	14	17	32	12	31	12	8	10	17		11	4	13	
2·0				6	13	16	30		30	11	7		16	14	10		12	30
	8	7	11		12	15	29	11	29	10	8	9	15	13	9	3	11	
		8	10	5	11	14	28	10	28	8	5		14	12	8	2	10	
	7	5		4	10	13	27	9	27	7	4	6	13	11		1		
		4	9		9	12	25	8	25	6	3		12	10	7		9	
3·0	6	3	8	3	8	11	24	7	24	5	2		10	9	6		8	20
		2	7	2	7		23		23	4	1	7	9		5		7	
	5	1			6	10	22	6	22	3			8	8	4			
			8	1	5	9	20	5	21	2		6	7	7			6	
	4		5		4	8	19	4	20	1			6	8	3		5	
4·0					3	7	18	3	18			5	5	5	2		4	10

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Z Scores (left)   T Scores (right)

DEP

VITA

Danny Pierce

Candidate for the Degree of

Doctor of Education

Thesis: THE ATTENTIONAL STYLE OF INTERCOLLEGIATE ATHLETES
BASED ON GENDER AND TYPE OF SPORT

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Professional Experience: Manager, Open Circle Natural
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Video, Oklahoma City, 1985-87; Graduate Assistant,
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Education, Recreation, and Dance; Phi Esplion
Kappa.