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A CROSS-CULTURAL EXAMINATION OF THE RELATIONSHIP BETWEEN ATTENTIONAL STYLE, COMPETITIVE ANXIETY AND BATTING PERFORMANCE OF MALE HIGH SCHOOL BASEBALL PLAYERS FROM PUERTO RICO AND THE UNITED STATES

By

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ABSTRACT

A CROSS-CULTURAL EXAMINATION OF THE RELATIONSHIP BETWEEN ATTENTIONAL STYLE, COMPETITIVE ANXIETY AND BATTING PERFORMANCE OF MALE HIGH SCHOOL BASEBALL PLAYERS FROM PUERTO RICO AND THE UNITED STATES

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The purposes of this study were to test the reliability and validity of the TAIS and a batting-specific version (B-TAIS) with high school baseball players, and to investigate differences between players in the United States and Puerto Rico. Tests of reliability failed to reach significant statistical levels for both the TAIS and B-TAIS. With respect to validity, the reduce-attention subscale of the B-TAIS was positively correlated to SCAT, and the OET-OIT subscales of the TAIS were significantly correlated with SCAT. The CSAI-2 was positively correlated with the OIT subscale, and negatively correlated with the NAR of the B-TAIS. OET-OIT subscales of the TAIS were positively correlated with the CSAI-2, the NAR was negatively correlated with the CSAI-2. Attentional styles were not significantly correlated with batting-performance. There were no significant statistical differences between the US and PR players on subscales of either test. Discussion focuses on the lack of psychometric strength, age bias, and the TAIS and B-TAIS failure to predict batting performance.

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To My Family

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CHAPTER I

INTRODUCTION

Nature of the Problem

When we hear the word attention we often think of elementary school teachers instructing their pupils to pay attention so they can learn the material. Focus of attention is a part of our everyday cognitive functions that allows us to complete daily routines. Routines such as watching television, listening to the radio, and cooking a meal would not be successfully completed without some degree of attentional focus. The same can be said for being involved with sports. Successful execution of sport skills requires a specific focus of attention. The difference between an elite athlete and a mediocre one may be how each directs his/her focus of attention towards the execution of a sport skill. If an athlete's attentional focus is affected by either environmental stimuli or internal thoughts and feelings, then the successful execution of the skill may be negatively affected as well as the end result. Thus, proper focus of attention will normally result in effective consequences for the task being performed.

Focus of attention touches every aspect of an individual's life, from being able to drive a car without causing an accident, to maintaining a simple rational

conversation. For the above reason, psychologists, as well as sport-psychologists, have studied the importance of attention and concentration on performance outcomes. Desirable performance outcomes in athletics have a direct relation to an athlete's level of attention and concentration towards the task (Cox, 1985). In relating the role of attention to sport performance, Nideffer (1981) suggested that for performance to be predicted, two factors must be considered: (1) the individual's athlete's ability to develop specific attentional styles, and (2) the attentional demands of the specific athletic situation. In addition, athletes, ability to control their attentional focus on the relevant task is crucial for predicting performance (Nideffer, 1979).

In order to predict performance, Nideffer (1981) argues that consideration must be given to three factors: (1) width of attention, (2) direction of attention, and (3) the ability to shift from one type of attention to another. Width of attention relates to how much information an individual takes-in from the environment and how much must be attended to during a given period of time. Furthermore, the width of attention varies on a continuum from broad to narrow. While an individual's width of attention may be focused in a broad or narrow manner, the second dimension, direction of attention is geared toward

internal cues such as thoughts and feelings or toward external stimuli that comes from cues within the environment. Finally, the shifting of the focus of attention entails an individual's ability to shift from direction to width of attention depending on the demands of the task. Nideffer (1981) proposed that each person has a 'preferred attetnional style' in which he/she functions, and which allows each person to function efficiently within one of the two dimensions (broad or narrow) in an instinctive fashion.

Nideffer (1976a) hypothesized that individuals have the capacity to direct their attention within four quadrants: broad-internal, broad-external, narrow-external, and narrow-internal. Individuals functioning within the broad-internal quadrant focus their attention on a variety of cognitive and emotional aspects of their bodies while attending to a particular task. The role of the coach exemplifies this attentional model. The coach must prepare a pre-game strategy, and he/she must analyze past events in order to draw new plans during a game. The broad-external focus allows individuals to respond to a complex and rapidly changing environment. The quarterback position in football often demands this type of attentional style. During "play action", the quarterback must read the defense and execute the correct offensive pattern in

order to be successful in completing the play. Players employing a narrow-external focus react to few stimuli, and once the motor action has been initiated, the action continues without change. Sports such as volleyball and baseball demand a narrow-external focus of attention because the ball dictates the action of any given player. Employing a narrow-internal focus of attention does not allow a person to respond to a quick changing environment. A narrow-internal focus is used by weight-lifters and long distance runners who focus their attention on aspects of their body, thoughts and feelings relative to their performance, and not on irrelevant external cues that will detract from their task execution.

Because Nideffer (1976b) believes that performance can be facilitated by assessing an athlete's attentional style, he developed the Test of Attentional and Interpersonal Styles (TAIS). The TAIS is a self-report instrument that determines a person's descriptive attentional style, and relates performance to the individual's ability to concentrate as well as his/her level of arousal. The TAIS is a paper and pencil questionnaire from which subjects' responses to specific questions are used to plot an attentional style. Furthermore, performance on the TAIS provides an indication of how prone an individual is to making mistakes because

of information overload, hence attending to excessive amounts of stimuli. To conclude, performance on the TAIS also provides feedback concerning a person's ability to narrow his/her attention, as well as to assess mistakes of underinclusion because the individual selected the improper focus of attention.

The TAIS is composed of six attentional subscales, with each subscale providing an individual score (Nideffer, 1976b). The score reflects the ability or inability of a person to function efficiently in the particular area of attentional style. A broad external attentional focus (BET) allows the individual to integrate extensive amounts of environmental stimuli at one time. The overloaded by external stimuli (OET) scale reflects a mistake prone person caused by an excessive amount of information coming from the environment. The broad internal attentional focus (BIT) allows the individual to effectively integrate information from different areas. The scale describing individuals that make many mistakes because of too many cognitive processes occurring simultaneously is called overloaded by internal stimuli (OIT). The narrow attentional focus (NAR) describes how effectively a person can narrow his/her focus of attention, thus overlooking information pertinent to the task.

Nideffer's (1981) theory of attentional style is

subject to one more component; namely, competitive arousal. According to Nideffer, as the level of arousal increases, the individual is influenced by his/her 'preferred attentional style'. This in turn creates a rigid attentional focus which disrupts the shift from one continuum to another (i.e., broad-external to narrow-external) when required by the task.

In addition, attention is affected by an increase in competitive arousal because a person's attentional focus begins to decrease involuntarily. As a consequence, the amount of internal and external stimuli processed is reduced, hence affecting performance of the task by underinclusion of information. Nideffer also suggested that as the level of competitive arousal increases, the individual tends to become more internally focused. This in turn creates strong thoughts and feelings (e.g., I am going to miss the shot) that may cause interference with execution of the task or skill.

By using the TAIS, Nideffer (1978) has been able to support his theory of attention predicting performance. A study of collegiate swimmers supported the notion that swimmers scoring high on the subscales of stimulus overload did not produce high performance results in competition. Conversely, those scoring high on the broad-internal attentional style yielded better performance outcomes.

Courtet and Landers (1978) reported similar results between TAIS responses and performance of rifle team members.

The validity of the TAIS has been supported by various researchers (Nideffer, 1976b; MacPherson & Nideffer, 1981; Reins & Bird, 1982). Studies have established the effectiveness of the instrument in predicting broad/narrow attentional ability. However, critics of the TAIS have argued that the instrument fails to discriminate adequately along the internal/external dimension of attention (Van Schoyck & Grasha, 1981). In addition, Vallerand (1983) maintains that the TAIS is not sensitive enough to differentiate among athletes (male basketball players) of different skill levels. The criticism raised towards the TAIS led Kirschenbaum and Bale (1980) to suggest the use of a sport specific version of the TAIS as a means for predicting performance.

To support the notion of a sport specific version of the TAIS, Van Schoyck and Grasha (1981) developed a tennis-specific instrument. The results showed higher test-retest reliability and internal consistency when predicting performance in comparison with the TAIS. Similar test-retest results were reported by Bergandi, Shryock, and Titus (1990) in a basketball-specific version of the TAIS.

Albrecht and Feltz (1987) developed the

batting-specific TAIS (B-TAIS) as the baseball version of the TAIS. The B-TAIS could serve as a tool to identify an athlete's strengths and weaknesses in attention or concentration when batting and facilitates further development or remediation. The B-TAIS could also be used to discriminate between athletes of different abilities in batting. The B-TAIS could be used by coaches as an instrument to aid in the training of baseball players. For example, if a player is identified with low attention or concentration skills, the coach can provide some intervention strategies to improve the concentration skills of the player.

The B-TAIS, according to Albrecht and Feltz (1987), produced a significant test-retest reliability in five of the six subscales of attentional style when compared to the TAIS. In addition, the B-TAIS was higher than the TAIS in internal consistency on all subscales. Furthermore, the findings of Albrecht and Feltz maintained a positive relationship between batting performance and proper focus of attention.

The need to add further support to the B-TAIS as a predictor of batting performance led to the comparison of the six attentional subscales of both the TAIS and B-TAIS. The subscales of the two surveys (TAIS and B-TAIS) showed a significant number of interscale correlations

among the components of BET, OET, BIT, OIT, NAR, and RED. However, the intercorrelations of the subscales of the B-TAIS showed higher corresponding correlations among the subscales than those of the TAIS. These results confirmed the notion previously established by Van Schoyck and Grasha (1981), as well as Albrecht and Feltz (1987), that an item with a specific sport frame of reference is less ambiguous and has less error variance than the original TAIS.

Albrecht and Feltz (1987) used the Sport Competition Anxiety Test (SCAT; Marten, 1977) and the Competitive State Anxiety Inventory-2 (CSAI-2; Martens, Burton, Vealey, Bump & Smith, 1983) to further support the broad and overload dimensions of the B-TAIS. The use of the SCAT and CSAI-2 provided concurrent validity among the broad and overload dimensions of both the TAIS and the B-TAIS. The results showed significant correlations among the B-TAIS and the TAIS subscales and the SCAT and CSAI-2 scores. Therefore, the researchers concluded that the batting-specific version of the TAIS follows closely with Nideffer's (1976a) theory of attentional styles.

Albrecht and Feltz (1987) departed from Nideffer's (1976a) original assessment of '<u>preferred attentional</u>' style. Instead of listing an individual's attentional style as broad external or internal (BET, BIT, NAR), they combined those categories and named them the '<u>effective</u>

attentional style'. Following this pattern, the subscales that cover the overload dimensions (OET, OIT, RED) were properly called 'ineffective attentional styles'. Thus, in relation to baseball, a player with an 'effective style of attention' is able to process a large amount of narrow-external information to produce desirable performance outcomes. On the contrary, the baseball player with an 'ineffective style of attention' tends to become distracted in a competitive situation; thus hindering his/her ability to focus on the required task, which in turn will produce subpar performance outcomes.

Purpose of the Study

The purpose of the present study was to replicate Albrecht and Feltz (1987) using the B-TAIS to examine a population of male, high school age baseball players. The results of this study may add further validity to the B-TAIS or may indicate that the B-TAIS must be adapted to accommodate younger age populations than those sampled (college age) by Albrecht and Feltz.

Furthermore, another extension of Albrecht and Feltz (1987) in this study was to examine differences in performance on the B-TAIS between Puerto Rican and United States male varsity high school baseball players. Most of the research done to date concentrates on using subjects from a Caucasian population, and the results then tend

to be generalized to other cultural and ethnic groups in our society. There is a definite lack of research in the area of attentional focus within a sport context using samples from a Hispanic population. Considering how diversified our current society has become, and the fact that the Hispanic population is the fastest and growing minority group within the United States, the need for research with Hispanics as subjects, as well as other ethnic groups, is self-evident. Research involving more diverse subject samples may further help us understand similarities and differences that exist among different populations in our society, and may lend support to, or dispel, concerns about culture-biased questionnaires.

Need for the Study

There were several reasons for attempting to conduct and replicate the study by Albrecht and Feltz (1987). First, reported research involving the use of the TAIS (Nideffer, 1976b) and research using sport specific versions of the TAIS (Van Schoyck & Grasha, 1981; Bergandi, Shryock & Titus, 1990) has been done with college age populations only. Thus, using a sample population of high school baseball players may help identify athletes at a younger age that have either 'effective or ineffective attentional styles' for the task they are asked to perform.

Therefore, if we can identify attentional styles through the use of the B-TAIS in a high school age population, then attempts can be made to teach athletes at an early age how to master the appropriate attentional style needed to master a specific sport. Identification of attentional styles may alleviate frustration or reduce the possibility of youth dropping out of sports, which occurs when youth are not being successful.

In addition, the lack of research using Hispanic youth as subjects is self-evident. Previous sport research on attentional styles (i.e., Van Schoyck & Grasha, 1981; Bergandi et al., 1990) has been done with samples from the college age Caucasian population. Therefore, the need for research using Hispanics and other ethnic groups as a sample may help us better understand the attentional styles of ethnically diverse groups.

Statement of the Problem

This study had three purposes: (a) to test the reliability and validity of the TAIS and B-TAIS with a sample of male varsity high school baseball players, (b) to compare the results of Albrecht's (1986) college sample with those of the high school sample of this study on the TAIS and B-TAIS, and, (c) to investigate if any differences in performance on the TAIS and B-TAIS exist between the two samples from the U.S. and Puerto Rico.

Hypotheses

Four different hpotheses were investigated. First, the overload and reduced B-TAIS and TAIS subscales of attention will be positively correlated with the cognitive and somatic subscales of the CSAI-2 and with trait anxiety as measured by SCAT.

Secondly, it was hypothesized that there would be a negative correlation between contact percentage in batting and ineffective attentional style scores. Effective attentional styles scores and contact percentage would show a positive correlation.

The third hypothesis was that there would be positive interscale correlations among the B-TAIS and TAIS subscales, while the B-TAIS would produce higher corresponding correlations than the TAIS. The subscale combinations of BET/BIT and OET/OIT would yield a high positive correlation similar to the results obtained by Albrecht and Feltz (1987).

The fourth hypothesis was that there would be no differences between contact percentage in batting and the subscale scores of the B-TAIS and TAIS for either the subject samples from Puerto Rico or the United States.

Delimitations

This study was delimited to male high school baseball players from English-speaking schools in Puerto Rico and

selected male high school students from public schools in the United States.

Limitations

This study was designed as a non-experimental study and was limited to natural occurring factors within the environment. The nature of the opponent's ability, facilities and equipment, luck or chance, coaching decisions, and the presence of fans could hinder the batting performance of the subjects. Also, the honesty of each subject's responses on the instruments could influence the scoring results. The sample was limited to the south-central region of the State of Michigan, and the northern region of Puerto Rico. Finally, age differences among subjects and the accuracy of baseball performance statistics gathered at the end of the season could also influence the results.

Definitions

Effective Attentional Style -- Indicated by summation of scores on the following B-TAIS and TAIS subscales: BET' BIT, NAR. Subjects obtaining high scores in these areas will be assumed to have an effective attentional style for the purpose of this study.

Ineffective Attentional Style -- Indicated by summation of scores on the following B-TAIS and TAIS subscales: OIT, OET, RED. Subjects obtaining high scores in these

areas will be assumed to have an ineffective attentional style for the purpose of this study.

Seasonal Strike-out Percentage -- The proportional frequency obtained by dividing the number of times a batter strikes out by the total number of official at bats for an entire season (Albrecht, 1986).

Seasonal Contact Percentage -- The proportional frequency obtained by subtracting the number of times a batter strikes out from the official number at bats, and dividing the remainder by official at bats for the entire season (Albrecht, 1986).

BET -- (Broad external attention): High scores on this scale are obtained by individuals who describe themselves as being able to effectively integrate many environmental stimuli at one time (Nideffer, 1976a).

OET -- (External overload): The higher the score the more mistakes due to being confused and overloaded by environmental information (Nideffer, 1976a).

BIT -- (Broad internal attentional focus): High scores see themselves as effectively integrating information from several different areas (Nideffer, 1976a)

OIT -- (Internal overload): The higher the score, the more mistakes individuals make because they think about too many things at once (Nideffer, 1976a).

NAR -- (Narrow attention): The higher the score, the

more effective individuals describe themselves in terms of ability to narrow attention (e.g., to study or read a book), (Nideffer, 1976a).

RED -- (Reduced attention): A high score indicates individuals make mistakes because they narrow attention too much, failing to include all of the task relevant information (Nideffer, 1976a).

INFP -- (Information processing): High scorers think alot and process a great deal of information (Nideffer, 1976a).

Cultural or ethnic background -- Refers to the two sample groups of high school baseball players that are native to the United States and Puerto Rico.

CHAPTER II

REVIEW OF THE LITERATURE

The world of sports has been considered the arena for demonstrating competitive athletic accomplishments. Those fortunate enough to achieve success or fame by means of their participation in sports have become a permanent fixture in the history books. Elite and professional athletes such as Jim Thorpe, Jesse Owens, Babe Ruth, and Michael Jordan will always be remembered because of their athletic prowess and success in their respective sports. For the average recreational athlete, the thought of performing like a Babe Ruth or a Michael Jordan may seem like a far-fetched idea, but athletes have some common traits which are essential for mastering sport skills. In addition to physical attributes, one specific cognitive trait needed to achieve success in sports is focus of attention or concentration.

The relationship between attention and athletic performance can be explained by the theory of attentional style proposed by Nideffer (1976a, 1976b, 1981). This theory states that athletic performance is directly related to an individual's anxiety level and the decrease of attention that follows when anxiety level increase.

The need to support His theory by empirical means led Nideffer (1976b) to develop the Test of Attentional

and Interpersonal Style (TAIS). Additional research however, indicated that giving the TAIS a sport-specific frame of reference would provide a higher correlation between an athlete's attentional style and the success or failure of his or her athletic performance (Nideffer, 1978; Van Schoyck & Grasha, 1981; Albrecht & Feltz, 1987). The purpose of this chapter is to further explain the need for the use of attentional assessment instruments to find the connection between attention and athletic performance. Selective attention, the arousal-performance relationship, and the theory of attentional style are topics covered in this chapter.

Selective Attention

Environmental distractions such as audiences, crowd noise, loud music and visual stimulation can cause disruption of cognitive processes. These environmental variables are often part of the normal scenario involving sporting events. There may be times when performance can decrease or be affected because of such distractions. Cherry (1981) used different types of distractors for testing selective attention skills in children. The performance scores of the children on an appropriate picture pointing task was hindered according to the type of distractor presented to them. Different sports carry selective dimensions of attention, and the athletes must

learn to block-out irrelevant cues while paying attention to more relevant cues. Tipper, Bourque, Anderson, and Brehaut (1989) conducted an experiment of selective attention with subjects having to perform while irrelevant stimuli were presented. Their results showed that performance in novel motor tasks was lower, with irrelevant cues causing more distraction in the subjects. Furthermore, Whitehurst and del Rey (1983) selected a group of undergraduate females without prior experience in open sports skills. The task was to track a moving light beam through different target areas on a pursuit rotor while contextual interference was presented. The subjects that were able to block out contextual interference obtained higher retention scores than the group that did not block contextual interference. Similar results were reported by del Rey, Wughalter, and Carnes (1987).

Attention has a positive impact on retention, recall and information. Baroni (1980) concluded that recognition of aspects of a real scene examined under three attention conditions was higher when the subjects used medium or high attention techniques. In addition, Maxeimer (1987) concluded that attention improves the reception of information, allowing athletes to perform better by using previously obtained information relative to their performance.

Furthermore, the chronological age of an individual determines the degree of selective attention used for attending to the execution of a particular task. Murphy-Berman and Wright (1987) concluded that on measures of attention, children would intuitively pace task-like reaction time to a speed that matches their attention span.

While selective attention has provided insight into our understanding of performance differences, other variables have been identified which influence performance. Emotions is one of these variables. Thus, the relationship between anxiety and performance has been one of the most studied questions by sport psychologists.

The Arousal-Performance Relationship

A factor that may influence the end-results of an athletic performance is an athlete's level of anxiety during competition. The understanding of the arousal-performance relationship can be attributed in part to the "inverted-U" hypothesis (Yerkes & Dodson, 1908). This hypothesis predicts that as arousal increases from drowsiness to alertness, there is a progressive increase in performance efficiency. However, once arousal continues to increase beyond alertness to a state of high excitement, there is a progressive decrease in task performance. Therefore, the inverted-U hypothesis suggests that behavior

is aroused and directed toward some kind of "optimal state" (Landers & Boutcher, 1986).

The inverted-U hypothesis has been tested with several studies. Martens and Landers (1970) found greater motor steadiness with subjects at intermediate levels of arousal as determined with a physiological measure. In addition, Wood and Hokanson (1965) have observed a similar inverted-U shaped pattern for performance when arousal has been experimentally produced by varying muscle tension. Furthermore, Levitt and Gutin (1971) found reaction-time performance curves resembling an inverted-U during subject's exercise sessions with a treadmill or bicycle ergometer of varying work-load intensities and durations.

Similar results were obtained by Yerkes and Dodson (1908) and Broadhurst (1957) using laboratory animals. Their findings indicated that on more complex tasks, the decrement in performance under increasing arousal conditions occurred earlier than it did for complex tasks.

Research studies involving the inverted-U relationship with athletes have found similar results to those obtained with laboratory animals. Fenz and Epstein (1967) have reported such relationships with physiological measures, self-report measures, and jumping efficiency of sport parachutists. Conversely, Klavora (1979) found inverted-U performance patterns among high school basketball

players as measured by performance ratings of coaches and self-reported anxiety measures by players for each game. The overall findings reported in the literature suggest that the inverted-U hypothesis seems to generalize across field and experimental situations with regard to the relationship of arousal and performance.

Another aspect of the arousal-performance relationship that needs to be explained is the connection between the complexity of the motor skill and the amount of arousal that is "optimal" for successfully executing the skill. The skill of putting in golf requires very precise fine motor control, thus very little arousal can be tolerated before performance decrements start to occur. In contrast, tasks such as weight-lifting involve minimal fine motor control, therefore the level of arousal can be much higher before performance begins to decrease. Hence, tasks that require complex cognitive demands require lower arousal levels for "optimal" performance of motor control tasks; motor tasks with lower cognitive demands can be exposed to higher levels of arousal before performance is impaired (Landers & Boutcher, 1986).

An additional component of the arousal-performance relationship is the perceptual narrowing and cue utilization of performers. Landers (1978, 1980) reported that when dual tasks are performed subjects will generally allocate

more attention to one of them in order to maintain or improve their performance. Landers believes that this strategy is used because humans have very limited spare capacity for focusing attention on task-irrelevant cues when they are performing complex motor skills.

The aspect of attention being shifted from secondary tasks to enhance the concentration necessary to perform the primary task was previously explained by Easterbrook (1959). The theory of cue utilization as stated by Easterbrook assumes that a perceptual field reduction occurs as arousal levels increase. Thus, a performer with low arousal levels would have a broad perceptual range and either through lack of effort or poor selectivity accepts irrelevant cues without discriminating. The accompanying result is a poor performance by the performer. However, when arousal increases to an "optimal" level, perceptual selectivity is augmented accordingly and performance improves, apparently because the performer tries harder or is more likely to eliminate task-irrelevant cues. An increase of arousal beyond the "optimal" point results in further perceptual narrowing, and the consequence is a decrement in performance levels. In general, Easterbrook (1959) and, later, Bacon (1974) suggest that the effects of arousal impair an individual's performance through a loss of perceptual sensitivity by interfering

with the individual's capacity to process the information that is presented.

The Theory of Attentional Style

Niddefer (1976a, 1976b, 1981) developed the theory of attentional style and human performance. This theory stipulates that an individual's attentional attentional focus is placed along the two dimensions of attentional breadth and direction. Direction of attention refers to the factors to whichh the individual is attending, e.g., internal cues such as feelings and thoughts, or external cues that may be part of the environment. Width or breadth of attention relates to how much information an individual must attend during a specific period of time. The breadth of attention falls along a narrow or broad scope of attention. Attending to large amounts of information from the environment requires a broad focus of attention. Whereas picking out a small amount of information or a single focal point requires a narrow focus of attention.

According to Nideffer (1976a, 1976b, 1981) the individual's ability to shift attentional focus from one of the above mentioned continuums to another allows humans to function predominantly within a relative limited range of the two dimensions of attention. The result is a tendency for individuals to develop a 'preferred attentional style'. Due to the individual's ability to shift along

the width and direction spectrums of attention, Nideffer identified four types of attentional style: (a) broad-external, (b) broad-internal, (c) narrow-external, and (d) narrow-internal. The broad-external individual focuses his/her attention on large amounts of changing stimuli from the environment and he/she makes decisions based on task completion requirements and available information. The quarterback position in football exemplifies the need for a broad-external focus of attention. This position requires the quarterback to react to the defensive and offensive players' reactions before completing the play. Individuals functioning within the broad-internal focus of attention direct their concentration to cognitive and emotional aspects of their bodies while attending to a particular task. For example, a pitcher in baseball or softball must decide ahead of time what type of pitch will be delivered to the batter he/she is facing, while also trying to stay within his/her own physical capabilities. The narrow-external focus of attention allows the individual to attend to an external stimulus that offers little change before the individual reacts and initiates a response. The skills of spiking in volleyball and batting in baseball demand a narrow-external attentional focus because the response of the players is in direct relation to the course of the ball. Individuals involved in these sports focus

their attention on how to respond to the flight of the ball, before attempting to successfully execute the striking of the ball. The narrow-internal focus places the attention of the individual on specific cognitive processes, processes which are aimed at offering solutions on how to properly execute a response that will result in an effective performance. In order for a golfer to have success on the field, he/she must be able to select the appropriate club. Club selection will depend on the golf course, weather conditions, and the golfer's having knowledge of his/her physical capabilities.

An important component of Nideffer's (1980, 1981) theory is the effects of increased levels of arousal on attentional focus. Nideffer contends that high levels of arousal affect attention in three different ways. First, as a result of an increase in arousal levels, the individual is unable to shift his/her focus of attention (i.e., from narrow-internal to narrow-external) according to the task demands. The inability to shift attention as a result of increased arousal levels predisposes the individual to remain fixed with their 'preferred attentional style' even if the 'preferred attentional style' does not meet the attentional demands of the specific task.

The second factor affecting attention due to an increase in arousal levels is perceptual narrowing and

cue utilization. As mentioned before, Easterbrook (1959) suggests that as the level of arousal increases the attentional width of the individual decreases, thus reducing the amount of information that can be processed from internal or external cues. The end result is the exclusion of relevant stimuli needed to successfully perform a task.

Nideffer's (1980, 1981) third contention is the individual's tendency to become internally focused when arousal levels increase. The internal focus of attention leads the individual to his/her own thoughts and feelings, detracting from external cues which are often necessary to execute the proper response needed for the desired task completion.

Test of Attentional and Interpersonal Style

The need to support his theory of attentional styles objectively and empirically led Nideffer (1976b) to develop the Test of Attentional and Interpersonal Styles (TAIS). The TAIS is designed to measure an individual's attentional style by means of the subject's responses to specific questions. The test provides an indication of how capable the individual is at developing a broad-external or internal focus of attention. In addition, the TAIS can indicate how prone an individual is to making mistakes because of information overload, due to the emphasis of attentional focus placed on excessive amounts of internal or external

stimuli. In addition, performance on the TAIS provides feedback on the individual's ability to narrow his/her attention to the demands of the task, and it indicates when mistakes are made due to the inability of the individual to select the correct focus of attention for the situational demands.

The original TAIS contains 144 items that are divided into 17 subscales designed to assess the individual's ability to effectively control a variety of life situations in an appropriate manner. The TAIS uses a 5-point rating scale (never, rarely, sometimes, frequently, always) for each item; subjects to rate the items in terms of the frequency with which each item relates to their daily lives.

The 17 subscales are divided into two subscales that assess behavioral and cognitive control in regards to information presented. Six of the subscales measure attentional focus, and nine describe an individual's ability to behave in a variety of interpersonal situations.

For purposes of this study, a modified version of the TAIS was used. The instrument's six subscales that measure attentional focus were used to form a 59-item questionnaire. These six subscales are designed to indicate an individual's tendency to adhere to an appropriate or inappropriate attentional style. The scales that indicate propensity for an individual to have an '<u>ineffective</u>

attentional style' are: (a) overload-external (OET), (b) overload-internal (OIT), and (c) reduced-attention (RED). Conversely, the scales indicating an individual's ability to have an 'effective attentional style' are: (a) broad-external (BET), (b) broad-internal (BIT), and (c) narrow-attention (NAR). Determining the respondent's 'preferred attentional style' is based on the nature of the subject's score for each subscale (Nideffer, 1976a, 1981).

The usefulness of any assessment instrument ultimately depends on the instrument's ability to consistently measure what it is supposed to measure. Thus, validity and reliability are key components in determining the worth of any instrument. The validity of the instrument refers to the truthfulness of the interpretation results of the test, while reliability pertains to the consistency of results obtained with an assessment instrument. Due to Nideffer's (1976b) claim of assessing attentional styles with the TAIS, several studies were conducted to prove the validity and reliability of the TAIS as an attentional assessment instrument.

The reliability of the TAIS's six attentional subscales was investigated by Van Schoyck and Grasha (1981). Their findings with tennis players indicated that the test-retest reliability of the six attentional subscales produced the

following Pearson product-moment correlation coefficients: BET=.84, OET=.79, BIT=.84, OIT=.80, NAR=.67, RED=.48. Further testing on the TAIS led the above researchers to test the internal consistency of the instrument, which was determined by obtaining the total score of each subscale, and following this procedure with correlations of each subscale. The results produced correlation coefficients of BET=.46, OET=.77, BIT=.70, OIT=.69, NAR=.73, and RED=.44. These results were more conclusive than those originally reported by Wolfe and Nideffer (1974) on the 17 TAIS subscales; they reported correlation coefficients ranging from .60 to .93 with a median of .83 on two subscales (obsessive, physical orientation), but failed to mention reliability results on the six attentional subscales.

The validity of the TAIS has been investigated by several studies in order to determine if the results support the claim of attentional style assessment by the TAIS. Nideffer and Wiens (1975) examined the construct validity (degree to which a test measures a hypothetical construct; Thomas & Nelson, 1985) of the TAIS by correlating TAIS scores with scores from established psychological instruments. The scores of 60 police applicants on the TAIS were correlated with scores of several psychological instruments, one of which was the Taylor Manifest Anxiety

Scale (TMAS). The results indicated that the TAIS on the 'ineffective attentional' subscales (OET, OIT, NAR) of the police applicants were positively correlated with the TMAS anxiety scores. The opposite (negative correlations) was found to be true with the TAIS subscales of the 'effective attentional style' group and the TMAS anxiety scores. Previous findings reported by Wolfe and Nideffer (1974) found similar results while correlating the TAIS with the State-Trait Anxiety Index (Speilberger, Gorsuch & Lushene, 1970).

Batting-specific Test of Attentional Style (B-TAIS)

Developed by Albrecht and Feltz (1987), the batting-specific version of the TAIS was based on previous research reported by Van Schoyck and Grasha (1981). Following a close resemblance to Nideffer's (1976b) original TAIS, Van Schoyck and Grasha developed a tennis version of the TAIS. Their reported findings concluded that the tennis version of the TAIS provided more reliable and valid estimates of an individual's attentional style as it relates to the specific attentional demands of the particular sport skill. In addition, the test-retest correlation coefficients (ranged from .68 to .91) for the tennis TAIS were higher than those obtained on the original TAIS. Further evidence of the stability of the sport-specific version of the TAIS was the higher internal consistency

results of the tennis version when compared to Nideffer's TAIS.

The batting-specific version of the TAIS was generated by two individuals (Albrecht & Feltz, 1987) with a strong background in psychology and baseball/softball batting skills. The 59 items contained in the B-TAIS (covering the six attentional and cognitive control subscales of the TAIS) were converted to a batting-specific frame of reference, while maintaining as much of the grammar, content, and wording of the original TAIS as possible.

After converting the 59 attentional and information processing subscale items of the TAIS to a batting-specific reference, the B-TAIS was reviewed by a panel of five sport psychologists. The selection process was based on the basis that each reviewer had recently published articles in the Journal of Sport Psychology with a focus in the area of attentional style and each used the TAIS as a measure of attentional style. The panel of reviewers rated all the items on the B-TAIS on the basis of maintaining close proximity to the contents of the original TAIS. Any disagreement among the panelists on any specific item was resolved by a majority vote. In addition, the B-TAIS was reviewed by a collegiate varsity baseball and softball coach, thus assuring the relevancy of the items specific to batting skills, and to measures of attentional style.

The reported findings of Albrecht and Feltz (1987) on the test-retest reliability and internal consistency of the B-TAIS when compared to the TAIS resulted in increased stability over time. The B-TAIS exhibited higher test-retest reliabilities on all but one subscale (OIT) when compared to the TAIS. The TAIS subscale of overloadinternal was significantly more stable ($\underline{Z}$=2.26, $\underline{p} < .05$) when compared to the OIT subscale of the B-TAIS.

The internal consistency of the B-TAIS subscales was significantly higher than the TAIS when Cronbach's (1951) alpha reliability coefficients were computed. Even though the B-TAIS coefficients ranged from .54 to .85, the .05 level of statistical significance was not reached, thus the reported findings were not able to support the internal consistency of all B-TAIS subscales.

The convergent validity (both instruments assessing the same phenomena) of the TAIS and B-TAIS was accepted by the two instruments obtaining a .50 correlation coefficient. This was higher than the previous reported coefficient (.40) reported by Van Schoyck and Grasha (1981).

The construct validity of both the TAIS and B-TAIS was correlated with the competitive trait anxiety measures SCAT and CTAI-2. The results reported by Albrecht and Feltz (1987) indicated a positive correlation between the attentional subscales of reduced attention (RED) and

competitive anxiety, in both the TAIS and B-TAIS. The B-TAIS was found to be significantly correlated with competitive anxiety on all attentional subscales measuring an '<u>ineffective attentional style</u>'. On the contrary, the TAIS produced no other significant correlations with competitive anxiety.

In regards to '<u>effective attentional style</u>', both the B-TAIS and TAIS exhibited positive correlations with competitive anxiety. Furthermore, both instruments were found to have a positive correlation between the narrow attention subscale (NAR) and the confidence subscale of the CTAI-2, while the cognitive and somatic anxiety subscales (CTAI-2) were found to be negatively correlated with the NAR subscales of both instruments. In addition, Albrecht and Feltz (1987) found positive correlations between the BET and BIT subscales of the TAIS and the confidence subscale of the CTAI-2. Conversely, the B-TAIS exhibited positive correlations between the OET and OIT subscales of attention and the somatic and cognitive subscales of competitive anxiety.

An additional test conducted by Albrecht and Feltz (1987) to prove the construct validity of the TAIS and B-TAIS was to establish the relationship between effective and ineffective subscale scores of attention and batting performance. Since Nideffer (1976a, 1976b, 1981) states

that batting in softball/baseball requires a narrow-external focus of attention, the narrow attention subscale (NAR) should be positively correlated with batting performance. Albrecht and Feltz found a positive correlation for the NAR subscale of the B-TAIS, but not for the original TAIS. However, both B-TAIS and TAIS subscales measuring ineffective attention (OET, OIT, RED) were found to be negatively related to seasonal batting performance. On the contrary, the effective attention subscales (BET, BIT, NAR) were found to be positively related to batting performance on the B-TAIS, but the same results were not found on the TAIS.

The overall conclusion is that by giving the TAIS a batting-specific frame of reference enhances the reliability and validity of the instrument, when administered to a population of college-age subjects. In addition, the instrument serves as a tool for predicting performance by examining subscale scores of effective and ineffective attentional style in relation to the specific task demands.

Throughout this chapter, all the studies that reported findings concerning the TAIS or sport-specific versions of the TAIS were based on results obtained from a population of college-age subjects. It was the intent of this study to further assess the instruments (TAIS, B-TAIS) validity

and reliability with a sample of high school teenagers from the United States and English speaking (second language) Puerto Ricans. Results of this study would add further support for the instruments as measures of attention, and would identify biases that may be inherent in the instruments. The use of a high school sample can help validate the TAIS and B-TAIS as measures of attentional style with populations of different age groups, while testing the instruments on a sample of Puerto Rican teenagers can determine cross-cultural validation of the instruments.

CHAPTER III

METHOD

Subjects

The sample consisted of 57 male high school varsity baseball players, who were members of various teams in the south-central region of Michigan or northern Puerto Rico. In choosing high school players for this sample, this study attempted to validate the B-TAIS with a sample of subjects not previously studied. The 20 subjects from the Puerto Rico (PR) sample were selected from available English-speaking private high schools. The mean age of the Puerto Rico sample was 15.75, (SD=1.3). The median age was 16. This sample (PR) had an average of 8.4 years, (SD=2.9) of experience playing baseball. As a group, their self-perceived ability in baseball was above average. The 37 subjects from the United States (US) sample were selected from available public high schools in Michigan. The mean age for the US sample was 17.3, (SD=.73). The median age was 17. The US sample had an average of 10 years, (SD=2.5) of experience playing baseball. The self-perceived ability of the US sample in baseball also was above average. The logic for using these two groups was to address the reliability and validity issue of the B-TAIS and TAIS with samples that documented research has neglected to report previously.

Measures of Attentional Style

As developed by Nideffer (1976b), the complete Test of Attentional and Interpersonal Styles (TAIS) contains 144 items grouped into 17 subscales of attentional and interpersonal style. The seventeen subscales are divided into six subscales that reflect attentional style, nine subscales that reflect different aspects of interpersonal style, and two subscales that concentrate on cognitive and behavioral features. However, only the items related to the six subscales of attentional style were used in this study.

The attentional style of the total sample of this study was assessed in two ways. The first measure consisted of a 59-item survey instrument using Nideffer's (1976b) subscales of attention and cognitive control (BET, OET, BIT, OIT, NAR, RED, INFP). In addition, the B-TAIS developed by Albrecht and Feltz (1987) was given to the subjects. The B-TAIS, the batting-specific version of the TAIS, also had 59 items in the survey covering the same subscales of the TAIS.

The test-retest reliability of the TAIS conducted by Nideffer (1976b) was supported by data collected on 45 male and 45 female undergraduates in an introductory psychology course. The TAIS produced significant intercorrelations among its subscales. (See Appendix A

for a complete copy of the TAIS.)

The batting-specific (B-TAIS; Albrecht & Feltz, 1987) is the baseball version of the TAIS, and uses the 59-item survey format that closely resembles the original TAIS. The B-TAIS test-retest reliability and internal consistency were assessed using Cronbach's alpha, and the reported results were significant on all subscales according to Albrecht and Feltz (1987). The results also pointed towards higher internal consistency in the B-TAIS subscales when compared to the TAIS. (See Appendix B for a complete copy of the B-TAIS.)

Measures of Competitive Anxiety

Developed by Martens (1977), the Sport Competition Anxiety Test (SCAT) is designed to assess an individual's trait anxiety before competition. The survey instrument contains 10 statements that measure feelings of uneasiness before competition and 5 statements that assesses a subject's truthfulness in responding. Martens (1977) conducted several laboratory and field experiments that tested the reliability and validity of the instrument. Results indicated the SCAT was a valid and reliable measure of anxiety. (See Appendix C for a complete copy of the SCAT.)

An additional measure of competitive anxiety used in this study was the Competitive State Anxiety

Inventory-2 (CSAI-2; Marten, Burton, Vealey, Bump, & Smith, 1983). The CSAI-2 is a 27-item, self-report instrument used to measure the multi-dimensional assessment of competitive state anxiety. There are three subscales of anxiety measured by the CSAI-2: (a) cognitive, (b) somatic, and (c) confidence. The type of scoring used in the CSAI-2 is a 4-point Likert-type scale. (See Appendix D for a complete copy of the CSAI-2.)

Finally, subjects were given a background questionnaire that provided information on the subject's previous experience in organized sports. (See Appendix E for a copy of the Background Questionnaire.) Also, an informed consent form was given to parents due to the age (minors) of the subjects participating in the study. (See Appendix F for a copy of the Informed Consent Form.)

Procedures

The protocol for obtaining permission to conduct research within the designated School District was followed. In addition, parental consent was obtained for each subject's participation in the study.

Prior to administration of the instruments, the coach of each team was briefed on the purpose and intent of the study. Subsequently, the investigator explained to the subjects the nature of the study, and the importance of truthful responses to the instruments. All responses

were confidential, but summary results were given to the coaches (if desired) upon completion of the study. The background questionnaire for each subject was given during the initial testing session.

The B-TAIS and TAIS were administered to each team individually in a group setting. This took place after the team had completed at least ten games.

For test-retest purposes, the B-TAIS, TAIS, SCAT and CSAI-2 were administered approximately two weeks after the first round of testing was completed. Cumulative batting-performance statistics were reported by the coach at the end of the season.

Treatment of Data

The statistical measures used to analyze the data consisted of means and standard deviations for each subscale of the B-TAIS, TAIS, SCAT, and CSAI-2. Cronbach's alpha was used to determine the test-retest reliability of the B-TAIS and the TAIS. In addition, a correlation matrix was used to examine the relationship of performance (contact-percentage) with the B-TAIS and TAIS. To conclude, *Z*-scores were used to compare subscale scores between the present study and Albrecht (1986), and *t*-tests were used to compare results on the subscales of the TAIS and B-TAIS from the Puerto Rican and United States baseball teams.

CHAPTER IV

This chapter contains two major sections: (a) results of statistical procedures used to examine the relationships among attentional style, competitive anxiety and performance, and (b) a general discussion of these findings. The results section has been divided into three subsections. The first subsection includes descriptive statistics for each measure of attentional style, anxiety and performance. The second compares the reliability of the general measure of attentional style to that of the modified, batting-specific version, and the third compares the validity of these two instruments. All results are reported at the .05 level of significance unless otherwise specified.

Results

Descriptive Statistics

Attentional measures. Means and standard deviations for each of the attentional and information processing subscales contained in Nideffer's (1976b) original TAIS and the batting-specific B-TAIS are presented in Table 1. Total sample statistics are given in addition to separate scores for the samples from the United States, Puerto Rico, and Albrecht's (1986) total sample.

In order to compare both population samples (Puerto Rico, United States), t-tests were performed, using the Statistical Package for the Social Sciences (Nie, N.H., Hull, C.H., Jenkins, J.G., Steinbrenner, K., & Bent, D.H.,

Table 1
Means and Standard Deviations for TAIS and B-TAIS Subscales

	TAIS		B-TAIS	
Subscale	M	SD	M	SD
Puerto Rico				
BET	12.30	2.15	14.36	2.21
OET	19.78	5.11	18.06	4.82
BIT	15.32	2.56	17.30	2.90
OIT	16.73	4.66	13.50	4.64
NAR	23.66	2.82	24.87	5.10
RED	26.65	4.12	24.00	4.74
INFP	42.16	7.74	43.00	6.12
United States				
BET	12.57	1.68	13.84	2.69
OET	20.03	4.61	18.44	4.06
BIT	17.18	2.08	17.77	3.07
OIT	17.32	4.27	13.96	3.07
NAR	23.23	4.38	24.49	4.62
RED	28.68	4.61	26.57	5.71
INFP	45.11	4.80	42.12	6.16
Total Sample				
BET	12.47	1.84	14.01	2.53
OET	19.92	4.75	18.31	4.31
BIT	16.53	2.41	17.60	3.00
OIT	17.11	4.38	13.80	3.66
NAR	23.37	3.90	24.62	4.75
RED	27.97	4.51	25.69	5.49
INFP	44.07	6.07	42.41	6.10
Albrecht *				
BET	14.03	2.63	13.77	2.88
OET	17.48	4.32	13.48	5.01
BIT	17.86	3.02	16.74	3.77
OIT	12.96	3.02	11.52	3.40
NAR	27.26	4.52	31.35	6.82
RED	24.93	3.56	23.00	5.83
INFP	42.11	7.08	40.23	7.29

PR (n)=20. US (n)=37. Total (n)=57. *[Albrecht 1986] (n)=29

1975), for each attentional and information processing subscale of the TAIS and B-TAIS to check for possible cultural differences that may have existed between the two populations. It was hypothesized that the findings would yield no significant differences among the scores of the two cultures (Puerto Rico, United States) in regards to scores on the TAIS or B-TAIS. The *t*-test results were nonsignificant on all subscales, except for two subscales of the TAIS. The broad-internal (BIT) was significant at the .005 level and the information processing (INFP) subscale approached significance (p=.088). Given that one *t*-test out of 14 conducted was significant at the .05 level, it was concluded that this finding may have occurred by chance alone and the groups were collapsed for subsequent analyses. (A summary of the results of the *t*-tests is shown in Appendix G.)

One of the purposes of this study was to compared the results of the present study with those reported by Albrecht (1986). Figures 1 through 6 illustrate how subjects' TAIS and B-TAIS scores from the present study compare to those reported by Albrecht (1986). The attentional profiles for the high school baseball players are compared with Albrecht's subscale scores by plotting the groups' means as *Z*-scores. Both Albrecht's and the present study *Z*-scores are plotted in comparison to Nideffer's (1976b) college norms which are represented

as a Z-score of 0.0 on each subscale. Given the exploratory nature of this study into the issue of cultural differences, plus the small sample sizes, Z-scores for the group samples of Puerto Rico and the United States were each compared to those scores presented by Albrecht (1986). In examining Figure 1, the total sample of high school baseball players scored above one standard deviation on the OIT subscale of the TAIS. The high score on the OIT scale indicates that the sample of teenagers reported higher scores for the overload-internal dimension of attentional style than the norm for college students (adults). However, one of the most dramatic differences between the college students in Albrecht's study (1986) and the teenagers of this study occurred on the NAR subscale. The high school sample of this study did not narrow their attention in accordance with the life-specific situations presented by the TAIS. Overall, results indicated that the high school sample tends to score high on the overload subscales (OET, OIT), as well as the reduced attention (RED) subscale, and low on the narrow attention (NAR) when compared to Albrecht's college sample.

Examination of Figure 2 indicates that the scores of the high school baseball players on the B-TAIS are almost a direct opposite of those obtained on the college sample reported by Albrecht (1986). Except for similar scores on the BET subscale, the high school sample produced

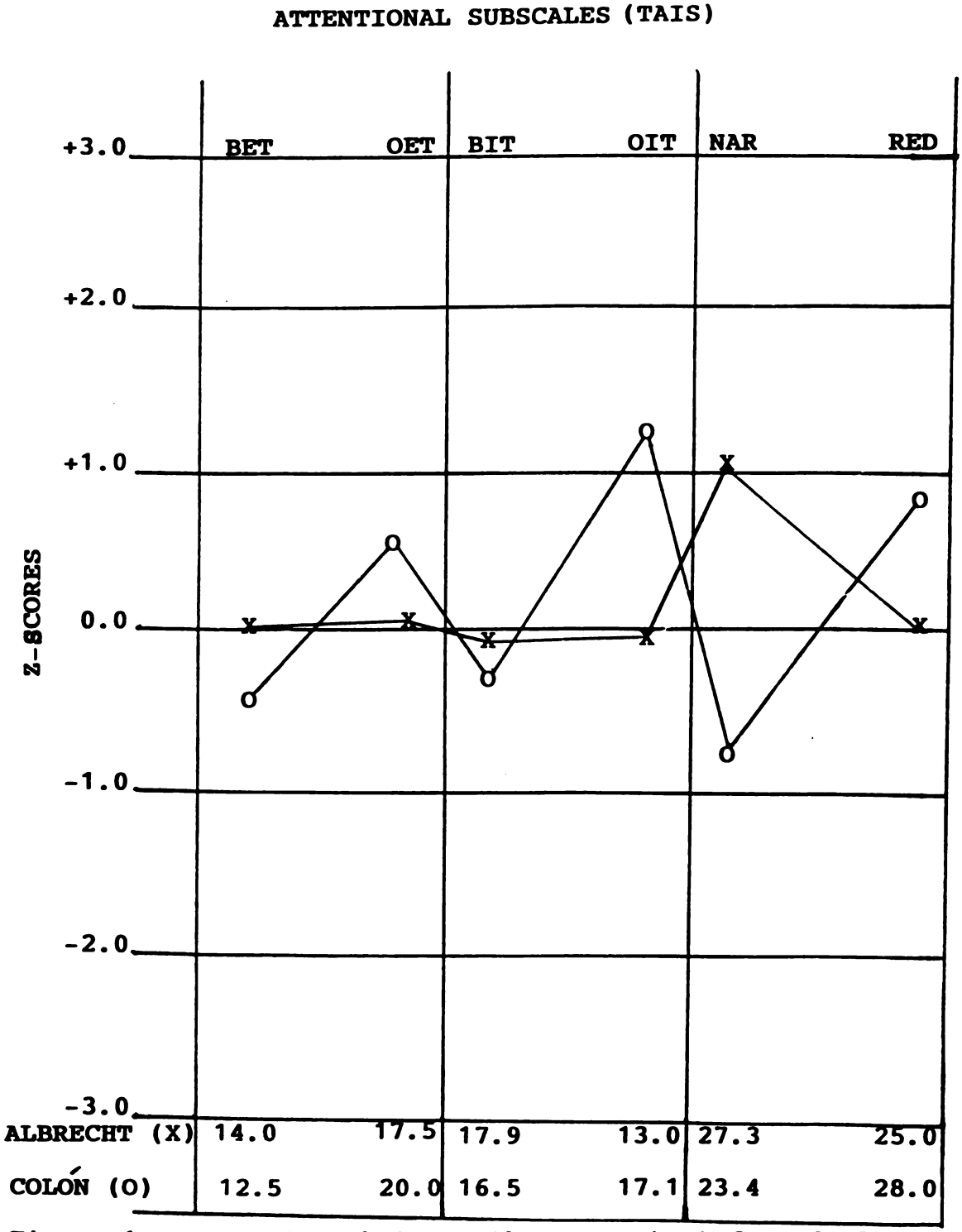


Figure 1. Comparison between the present study and Albrecht's subscale scores of college student norms.

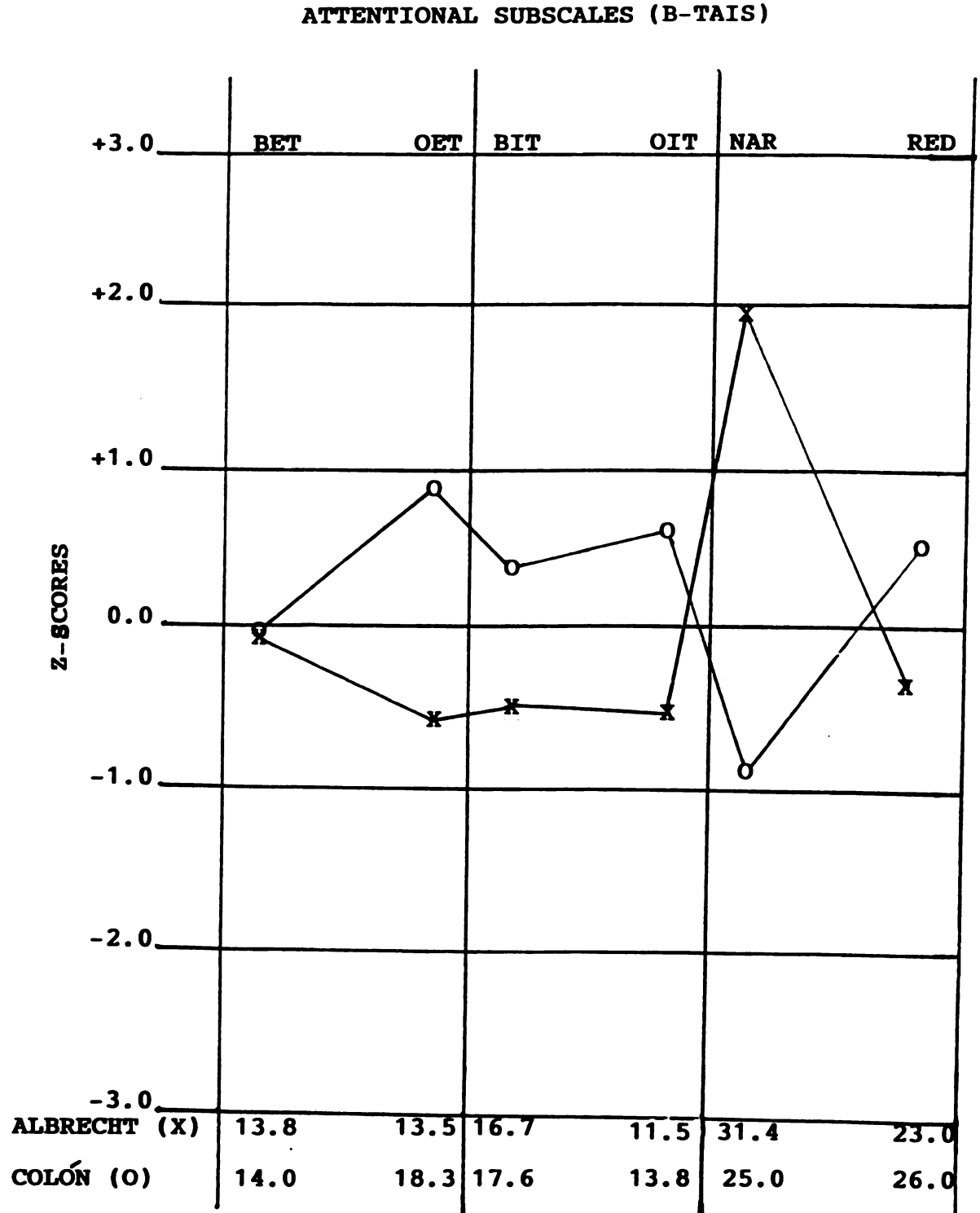


Figure 2. Comparison between the present study and Albrecht's subscale scores of college student norms.

positive Z-scores on the OET, BIT, OIT, and RED subscales while the NAR was almost a full standard deviation away from the norm in a negative direction. These results denote a tendency for the sample of the present study to be overloaded with external and internal information related to batting-specific situations presented by the B-TAIS. In contrast, the results of the NAR subscale of the B-TAIS indicated that the teenage sample did not narrow their attention for batting-specific situations.

Figures 3 and 4 highlight the Z-scores of the Puerto Rico high school baseball players in relation to the scores of college baseball/softball players of Albrecht's study (1986)for both the TAIS and the B-TAIS. The TAIS scores suggest a strong tendency for internal-overload (OIT) of information in the life-specific situations presented by the TAIS. The Puerto Rico subjects also had difficulty narrowing their focus of attention in relation to the amount of information presented. The Z-scores of the Puerto Rico sample in the batting-specific version (B-TAIS) of the TAIS indicated a similar response to the NAR subscale of both instruments. Once again the subjects did not narrow their focus of attention in relation to the batting-specific information presented by the B-TAIS. Results also showed a tendency for the Puerto Rico sample to be overloaded with internal and external information related to the batting scenarios put forth by the B-TAIS. In similar

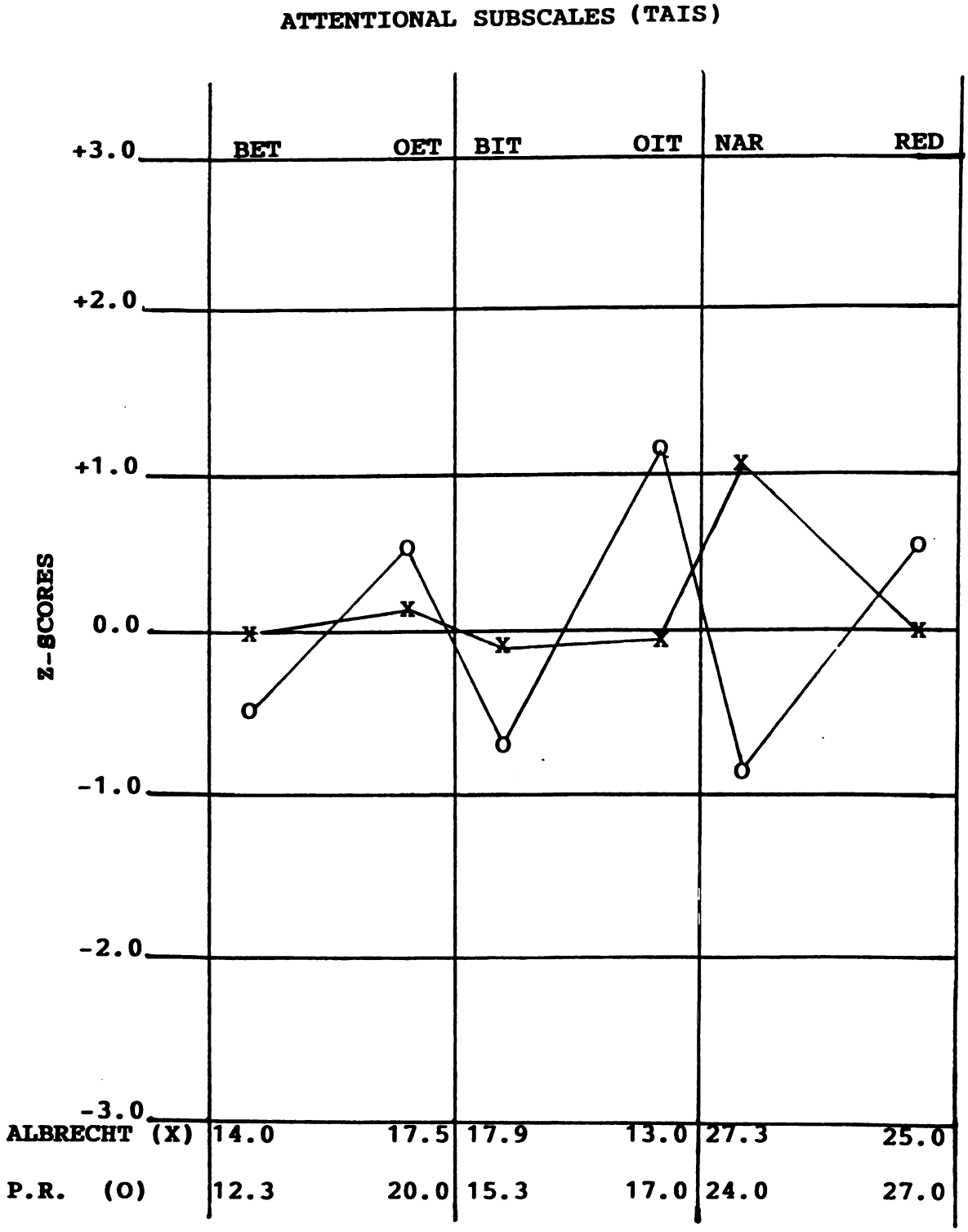


Figure 3. Comparison between the Puerto Rico sample and Albrecht's subscale scores of college student norms.

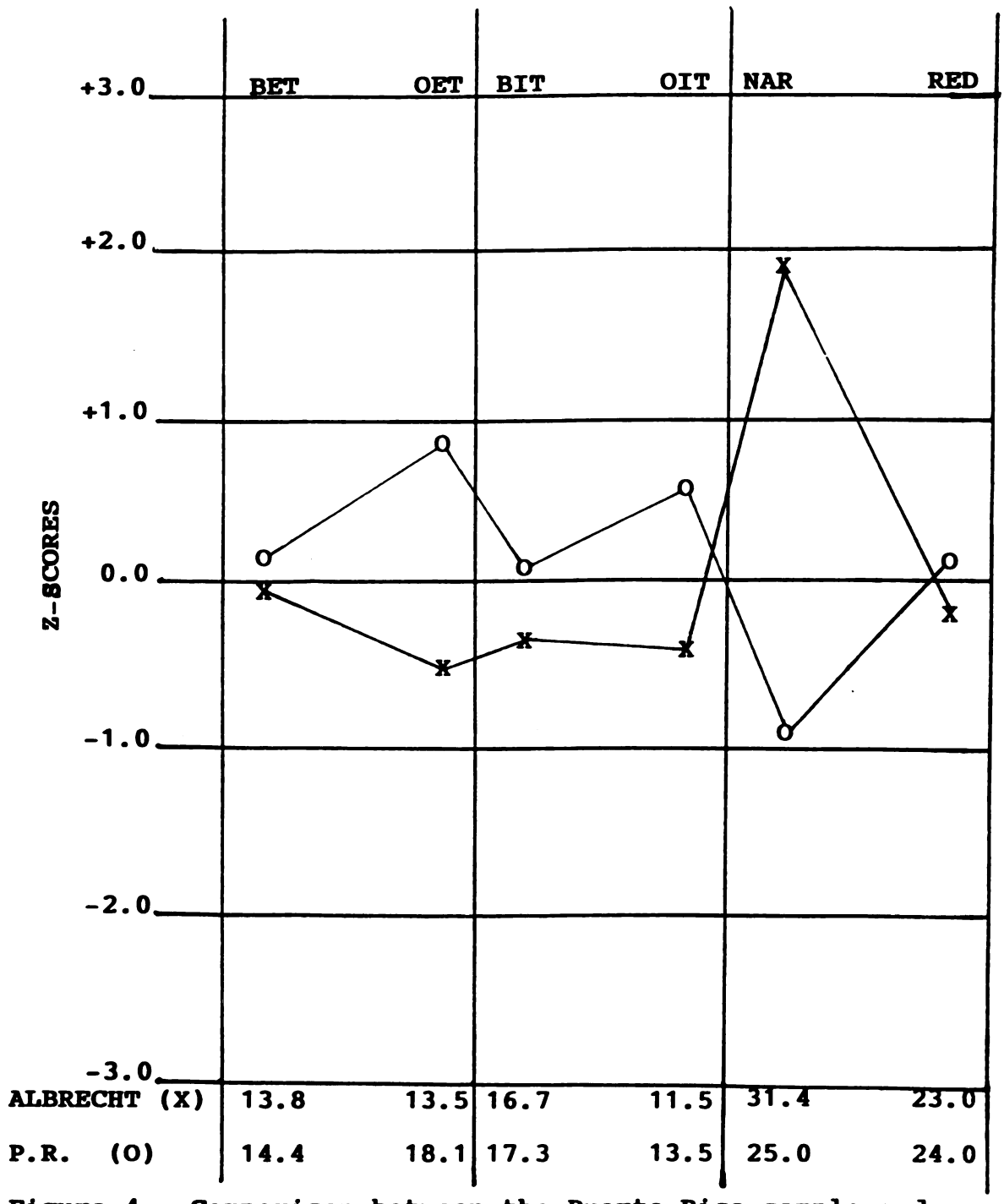


Figure 4. Comparison between the Puerto Rico sample and Albrecht's subscale scores of college student norms.

fashion, Figures 5 and 6 show the Z-scores for the American high school baseball players compared to Albrecht's (1986) college players. The results indicate that the sample of American high school baseball players when compared to Albrecht's college sample scored in a very similar response pattern to that of the Puerto Rico sample, adding more support to the previously stated hypothesis of no significant differences on instrument scores for both cultures. The US sample had a Z-score on the OIT subscale (TAIS) of almost two standard deviations above the mean, once again suggesting a high internal overload of information. The subscale of narrow attentional focus on both instruments (TAIS, B-TAIS) yielded a negative score, indicating a lack of narrow attentional focus to task demands for the American sample. A summary of the Z-score results is presented in Appendix H.

Competitive anxiety measures. Two measures of competitive trait anxiety were completed by each subject. The Sport Competition Anxiety Test (SCAT; Martens, 1977) was administered during the initial testing session and during the post-test session two weeks later. The Competitive State Anxiety Inventory-2 (CSAI-2; Martens, Burton, Vealey, Bump, & Smith, 1983) was also given at the time of the retest session. Means and standard deviations for each sample are given in Table 2 for both anxiety instruments. However, the scores for the sample

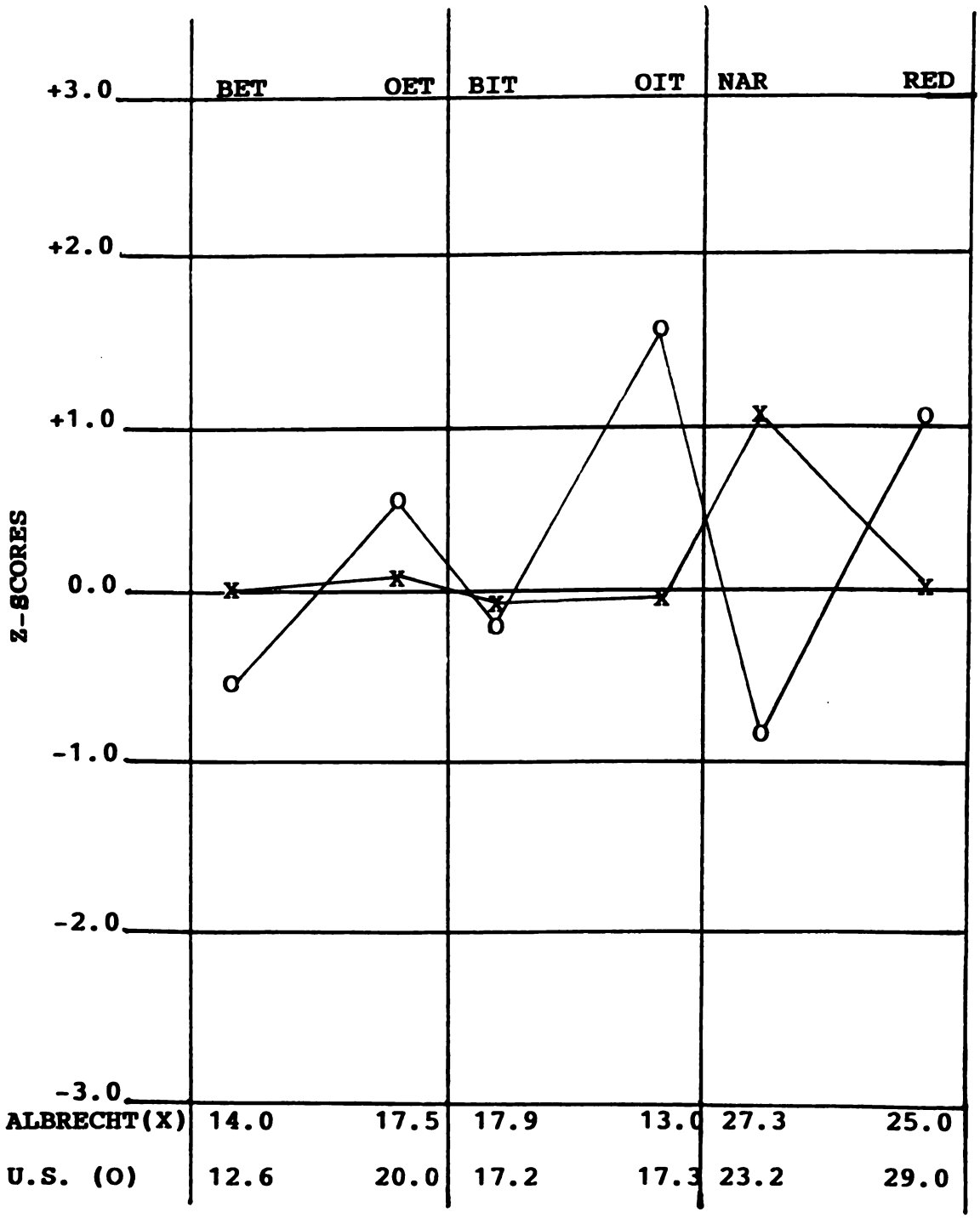
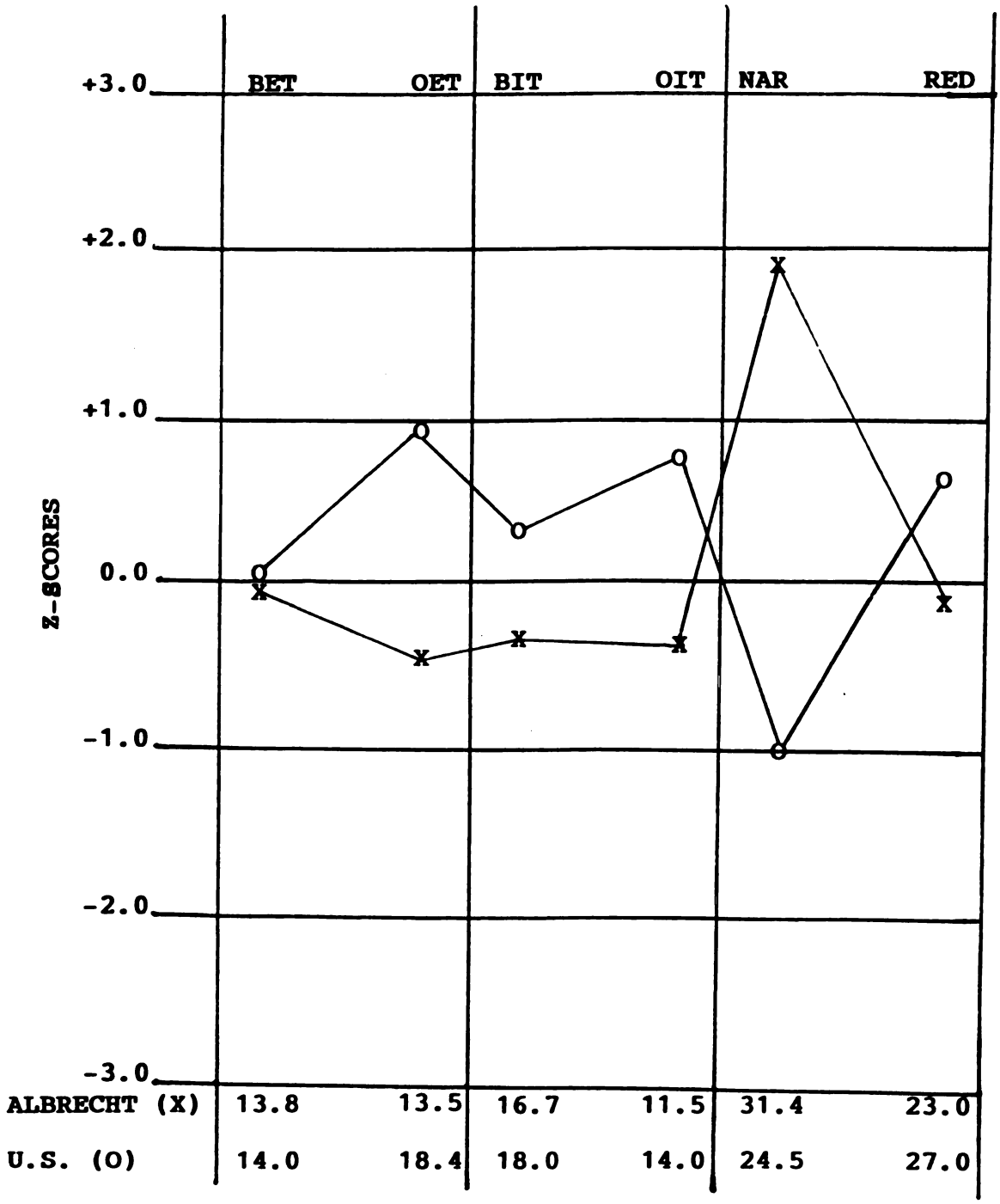


Figure 5. Comparison between the United States sample and Albrecht's subscale scores of college student norms.



	BET	OET	BIT	OIT	NAR	RED
ALBRECHT (X)	13.8	13.5	16.7	11.5	31.4	23.0
U.S. (O)	14.0	18.4	18.0	14.0	24.5	27.0

Figure 6. Comparison between the United States sample and Albrecht's subscale scores of college student norms.

of high school baseball players of the present study are somewhat higher in both anxiety measures (SCAT & CSAI2) when compared with Albrecht's (1986) except for the Confidence subscale of the CSAI-2. Results from t-tests performed between the Puerto Rico and United States samples revealed no significant differences for the anxiety and confidence measures of the CSAI-2. A summary of the results of the t-tests performed is shown in Appendix G.

Comparison of TAIS and B-TAIS Reliability

Test-retest reliability. The stability of the original TAIS and its modified, batting-specific (B-TAIS) counterpart was examined by calculating two-week test-retest reliability coefficients for each instrument's attentional subscales. Test-retest coefficients for TAIS and B-TAIS subscales are presented in Table 3.

Based on the findings of previous studies involving sport-specific versions of the TAIS (Albrecht & Feltz, 1987; Van Schoyck & Grasha, 1981), it was expected that the B-TAIS would exhibit higher test-retest correlations than the original TAIS on all six attentional subscales. However, examination of Table 3 yields two revealing findings. First, there exists a notable contrast in the reliability results between the present study and Albrecht's (1986). The reported results for Albrecht's (1986) college sample indicated that on five of the seven subscales (BET, OET, BIT, NAR, RED) the B-TAIS produced higher test-retest

Table 2
Means and Standard Deviations for Competitive Trait Anxiety Measures

	Measures							
			CSAI-2					
	SCAT		Cognitive		Somatic		Confidence	
Group	M	SD	M	SD	M	SD	M	SD
Puerto Rico	19.14	2.63	21.27	5.07	18.77	4.11	25.69	5.86
U.S.	19.46	3.44	21.09	6.49	17.31	5.66	26.61	6.14
Tot. Sample	19.35	3.15	21.15	5.99	17.81	5.17	26.65	6.00
Albrecht *	17.55	3.90	16.46	3.23	14.41	3.57	28.82	4.03

PR Sample (n)=20. US Sample (n)=37. Total Sample (n)=57.
*Albrecht (1986), (n)=29.

Table 3
Test-Retest Reliability Coefficients for TAIS and B-TAIS Subscales

	PR Sample		US Sample		Total Sample	
Subscale	TAIS	B-TAIS	TAIS	B-TAIS	TAIS	B-TAIS
BET	.77	.73	.58	.65	.67	.67
OET	.70	.65	.85	.78	.79	.67
BIT	.76	-.13	.65	.32	.66	.18
OIT	.68	.64	.77	.70	.73	.65
NAR	.06	.40	.56	.56	.48	.50
RED	.53	.70	.22	.59	.30	.61
INFP	.88	.20	.72	.69	.79	.52

Albrecht's Reliability Coefficients **	TAIS	B-TAIS
Broad External (BET)	.82*	.88*
Overload External (OET)	.82*	.87*
Broad Internal (BIT)	.92*	.95*
Overload Internal (OIT)	.91*	.72*
Narrow Attention (NAR)	.82*	.84*
Reduced Attention (RED)	.72*	.76*
Information Processing (INFP)	.92*	.90*

** Albrecht (1986)
* All reliability coefficients were significant at the .05 level.

scores than the TAIS, thus suggesting more stability with the batting-specific instrument than with the TAIS. However, all subscales of both the TAIS and B-TAIS were significant at the .05 level for the test-retest reliability coefficients of Albrecht's (1986) college sample. On the contrary, the reported results for the teenage sample of the present study produced higher scores on only two B-TAIS subscales (NAR, RED) when compared to the TAIS. Therefore, the test-retest results indicated that the stability of the B-TAIS in the present study was not strong from a statistical standpoint, and all the subscales of the TAIS and B-TAIS were not significant at the .05 level.

Secondly, the B-TAIS test-retest reliability coefficients of the total sample for the present study are quite low, with only four subscales (BET=.67, OET=.67, OIT=.61, RED=.61) approaching the desired standard reliability of .70 stipulated by Jensen (1978). Further analysis of the test-retest reliability coefficients exhibited by the TAIS indicated that the coefficient results obtained by the total sample of the present study did not account for statistical reliability of the instrument. Even though three subscales (OET=.79, OIT=.73, INFP=.79) did surpass the desired level of standard reliability proposed by Jensen, the remaining coefficient results did not provide enough statistical significance to establish the reliability of the TAIS. Thus, it could be concluded

that neither the B-TAIS nor the TAIS possesses reliable subscales when administered to a sample of male high school baseball players.

Internal Consistency. According to Albrecht (1986), the B-TAIS subscales should exhibit greater internal consistency than the TAIS corresponding subscales. An estimate of the consistency with which subscale items measured each attentional and information processing dimension was assessed by computing Cronbach alpha reliability coefficients (Cronbach, 1951) for each TAIS and B-TAIS subscales. Alpha reliability coefficients for each attentional instrument are reported in Table 4.

Examination of Table 4 reveals that results with the total teenage sample did find higher consistency on five B-TAIS subscales when compared to the TAIS subscales (BET, BIT, NAR, RED, INFP). The two subscales (OET, OIT) had lower consistency scores than the TAIS, and were significantly lower in comparison to Albrecht's (1986) results with college athletes using the same analysis. Thus, if Jensen's (1978) estimate of standard reliability of .70 was used to establish the reliability of the present study, it could be inferred that none of the subscales for both the TAIS and B-TAIS would be reliable for high school baseball players from Puerto Rico or the United States. However, it must be pointed out that three subscales of the B-TAIS (NAR=.68, RED=.67, INFP=.67) had

Table 4
Internal Consistency Reliability Coefficients for TAIS and B-TAIS Subscales

Subscale	TAIS	B-TAIS
Puerto Rico		
BET	.05	.20
OET	.59	.54
BIT	.004	.41
OIT	.71	.63
NAR	-.26	.66
RED	.32	.56
INFP	.69	.64
United States		
BET	.008	.37
OET	.67	.54
BIT	-.07	.49
OIT	.74	.42
NAR	.67	.70
RED	.59	.69
INFP	.52	.68
Total Sample		
BET	.02	.48
OET	.63	.53
BIT	.09	.45
OIT	.73	.53
NAR	.50	.68
RED	.52	.67
INFP	.61	.67
Albrecht *		
BET	.55	.65
OET	.76	.85
BIT	.41	.54
OIT	.68	.75
NAR	.64	.71
RED	.13	.50
INFP	.37	.63

* Albrecht (1986)

a very close approximation to the desired .70; while the TAIS had only two subscales (OET=.63, INFP=.61) that came close to the .70 standard for reliability. Overall, however, the reliability of the subscales of the TAIS and B-TAIS is weak when tested with a teenage sample.

Following the guidelines stipulated by Van Schoyck (1979), and Albrecht (1986), subscale independence can be determined by computing interscale correlations. An indication of attentional subscale independence would be a relatively low interscale correlation among the scales. Interscale correlation coefficients for the TAIS and B-TAIS are shown in Table 5.

Inspection of Table 5 displays similar results to those obtained in Albrecht's (1986) study. Six interscale correlations computed for the B-TAIS and four interscale correlations for the TAIS were found to be positively and significantly correlated, thereby suggesting a lack of independence between these subscales. The subscales assessing '<u>ineffective attentional styles</u>' (OET, OIT, RED) were significantly intercorrelated on both instruments. Similarly, the '<u>effective attentional styles</u>' subscales (BET, BIT, NAR) were significantly interrelated on the B-TAIS; however, on the TAIS only the BET-BIT relationship was found to be significant.

It was hypothesized that a significant interscale correlation would exist among the subscales of the TAIS

Table 5
Interscale Correlations Among the B-TAIS and TAIS Attentional and Information Processing Subscales

B-TAIS

	BET	OET	BIT	OIT	NAR	RED	INFP
BET	1.00						
OET	-0.16	1.00					
BIT	0.51**	-0.12	1.00				
OIT	-0.07	0.58**	-0.11	1.00			
NAR	0.47**	-0.34**	0.53**	-0.29*	1.00		
RED	-0.13	0.67**	0.06	0.61**	-0.02	1.00	
INFP	0.63**	-0.11	0.71**	-0.08	0.62**	0.08	1.00

TAIS

	BET	OET	BIT	OIT	NAR	RED	INFP
BET	1.00						
OET	-0.13	1.00					
BIT	0.49**	0.13	1.00				
OIT	0.31	0.74**	0.22	1.00			
NAR	-0.09	-0.12	-0.07	-0.26			
RED	-0.01	0.67**	0.20	0.76**	0.09	1.00	
INFP	0.64**	0.17	0.74**	0.15	0.03	0.19	1.00

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

and the B-TAIS, with the B-TAIS producing a higher corresponding correlation than the TAIS. Furthermore, the subscale combination of BET, BIT, NAR ('effective attention') and OET, OIT, RED ('ineffective attention') would produce a high positive correlation. The findings of the present study do support the above stated hypothesis due to the significant correlation of the subscales which form part of the 'effective' and 'ineffective' attentional style groups. Moreover, the B-TAIS did produce higher corresponding interscale correlations among its subscales than the TAIS.

Construct validity. According to Nideffer's (1976a, 1976b, 1981) theory of attentional style, an increase in an individual's anxiety levels are associated with involuntary reductions of attentional scope, and a predominantly internal focus of attention. Therefore, it was hypothesized that a significant positive correlation between anxiety and reduction of attention, plus anxiety and attention overload on both the TAIS and the B-TAIS would exist. The correlation coefficients between competitive trait anxiety, as measured by SCAT and the CSAI-2 and attentional subscales contained in the TAIS and B-TAIS are presented in Table 6. Results showed a positive correlation for the B-TAIS attention reduction subscale (RED) and competitive trait anxiety (SCAT), but the TAIS did not yield the same low to moderate correlation.

Table 6
Correlation Coefficients Between B-TAIS and TAIS Attentional Subscales and Competitive Trait Anxiety (n=57)

Subscale	SCAT	CSAI-2 Cognitive	CSAI-2 Somatic	CSAI-2 Confidence
B-TAIS				
BET	-0.39	-0.08	-0.05	0.43**
OET	0.29*	0.39	0.07	-0.21
BIT	-0.02	- 0.006	0.07	0.28*
OIT	0.40**	0.35**	0.13	-0.24
NAR	-0.14	- 0.34*	-0.13	0.54**
RED	0.27*	0.13	0.20	-0.11
INFP	0.05	0.06	0.03	0.32*
TAIS				
BET	-0.27*	-0.04	-0.17	0.16
OET	0.31*	0.34**	0.12	-0.16
BIT	0.002	0.17	-0.22	0.08
OIT	0.20	0.38**	0.14	-0.21
NAR	-0.30*	- 0.29*	-0.12	0.45**
RED	0.05	0.25	-0.09	-0.12
INFP	-0.10	0.05	-0.07	0.14

Note. BET, BIT, and NAR indicate "effective" attentional style. OET, OIT, and RED indicate "ineffective" attentional style.

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

Thus, the B-TAIS findings support the above stated hypothesis yet the results would not support the TAIS in connection with reduced attention and competitive trait anxiety. In contrast, the TAIS did show positive correlations with competitive trait anxiety (SCAT) in both overload (external, internal) subscales, which are part of the 'ineffective attentional style' group. Similar results were obtained from the subscales in the B-TAIS that form part of the 'ineffective attentional style'. Hence, these findings provided partial support for the stated hypothesis of positive correlations between levels of anxiety and attentional overload. The findings of the present study with male high school baseball players partially support the notion that the B-TAIS has construct validity because of the contention that attention tends to become diffuse because of high levels of arousal. Thus, the statistical results obtained in this study were not significantly strong to give the B-TAIS or TAIS validity with a population sample of male teenagers.

Batting Performance

The theory of attentional style (Nideffer, 1976a, 1976b, 1981) suggests that batting a baseball requires a narrow-external focus of attention. Thus, contact percentage should have a negative correlation with the subscales (OET, OIT, RED) of the 'ineffective attentional style' group. It was hypothesized that a negative

correlation would be obtained between contact percentage and the 'ineffective attentional style' group of subscales, and a positive correlation would be found between 'effective attentional style' and contact percentage.

The findings in Albrecht's (1986) college sample support the hypothetical construct of the attentional style theory. In contrast, the findings in the present study using a sample of high school baseball players from Puerto Rico and the United States produced no significant correlations between contact percentage and attentional style. Examination of the correlation coefficients between contact percentage and subscales of the TAIS and B-TAIS are reported in Table 7, and the results indicate that no statistical significance was found. The correlation coefficients obtained for the sample of male high school baseball players ranged from -.32 to .20 for all subscales of the TAIS, and -.04 to .12 for the B-TAIS subscales. Due to the above stated results, the previously mentioned hypothesis could not be supported by the findings of the present study using a male high school sample. The overall results of the study using the TAIS and B-TAIS with a sample of high school baseball players from Puerto Rico and United States would indicate that the scores obtained by both groups are rather similar, thus presenting very little significant difference between the two groups. As a total sample however, the American and Puerto Rican high school

Table 7
Correlation Coefficients Between Contact Percentage and TAIS and B-TAIS Attentional Subscales

Attentional Subscale	TAIS	B-TAIS
Effective Attention		
Narrow Attention (NAR)	-0.09	0.01
Broad Internal (BIT)	-0.15	0.08
Broad External (BET)	-0.32	0.03
Ineffective Attention		
Reduced Attention (RED)	0.07	-0.04
Overload Internal (OIT)	0.006	0.01
Overload External (OET)	0.20	0.12
(n)=28		
Albrecht *		
Effective Attention		
Narrow Attention (NAR)	-0.11	0.30
Broad Internal (BIT)	-0.21	0.57**
Broad External (BET)	-0.21	0.25
Ineffective Attention		
Reduced Attention (RED)	-0.18	-0.27
Overload Internal (OIT)	-0.51**	-0.45**
Overload External (OET)	-0.62**	-0.36

n = 29.

** p < .05.

* Albrecht (1986)

baseball players obtained no significant correlations between attentional style and contact percentage. On the other hand, the results of the high school sample did support findings for interscale correlations among the TAIS and B-TAIS instruments, with the B-TAIS obtaining higher correlations. Further support (in the form of a positive correlation) was found for the relationship between levels of anxiety and reduced attention which forms part of the attentional style theory.

Chapter V

Discussion

According to Nideffer's (1976a, 1976b, 1981) theory of attentional style, the specific focus of attention needed to successfully master the skill of batting in baseball is a narrow-external attentional style. This type of attentional style (narrow-external) is used by a batter in order to focus on the ball before and during the skill of batting in baseball.

Previous research assessing the need of attentional style (Van Schoyck & Grasha, 1981; Albrecht & Feltz, 1987) for achieving successful performance outcomes have been conducted using a sample of US college level athletes. The above mentioned studies with Caucasian college-age (adult) subjects have supported the notion of proper attentional focus leading to desired outcomes in performance. However, one of the weaknesses of this line of research is the lack of research which focuses on the assessment of attentional styles with population samples of different age groups and with samples from different cultures.

The first purpose of the present study was to assess the reliability of the TAIS and B-TAIS with a population sample of male high school baseball players. Two types of reliability were examined: test-retest reliability and internal consistency. The results for the total sample

revealed that the test-retest correlation coefficients for both the TAIS and B-TAIS were moderate for both instruments with reliability coefficients ranging from .50 to .70. The TAIS exhibited slightly more stability than the B-TAIS on four (OET, BIT, OIT, INFP) of the seven attentional subscales (shown in Table 3). In addition, the TAIS obtained the same coefficient in the BET subscale as the B-TAIS, adding more justification to the TAIS being slightly more stable than the B-TAIS. Scores on the B-TAIS were higher than the TAIS in only two subscales, NAR and RED, yet the only statistical difference was found on the RED subscale (TAIS=.30, B-TAIS=.61). Overall, however, reliability is questionable for both the TAIS and B-TAIS, suggesting that these attentional assessment instruments are more suitable for college students than high school students.

Due to the findings of Albrecht's (1986) research, it was expected that the B-TAIS attentional and information processing subscales would exhibit higher internal consistency than the original TAIS subscales. However, the findings of the present study using a sample of male high school baseball players from Puerto Rico and the United States indicated that the instruments lack statistical reliability. Thus, it would be wrong to assume that both the TAIS and B-TAIS are internally consistent instruments for assessing attentional focus with a sample of high school

athletes. It must be pointed out however, that three subscales of the B-TAIS did approach the desired .70 standard of reliability (Jensen, 1978) by exhibiting coefficients of NAR=.68, RED=.67, and INFP=.67 respectively. The TAIS produced two subscales (OET=.63, INFP=.61) which came close to approaching the desired standard of reliability.

These results suggest that the TAIS and B-TAIS may not be assessing the proper attentional focus of subjects ranging from ages 14 to 19 in a consistent manner, thus making the test somewhat unreliable for the teenage population studied. Since the Puerto Rico and United States sample were in the same age range, it can be inferred that the instruments appear to be consistently reliable with populations of college age subjects. One potential explanation is that the college sample is more homogeneous and developmentally advanced in terms of attentional focus, intellect, social, and cultural development than a high school sample. Thus, the college sample is able to interpret and understand the nature of the questions in both the TAIS and B-TAIS in a more precise manner.

A reason for the lack of statistical reliability found within the TAIS and B-TAIS in assessing attentional styles of teenagers could be found in the type of vocabulary used in the questions of both instruments. When the instruments were developed, the researchers (Nideffer, 1976; Van Schoyck

& Grasha, 1981; Albrecht, 1986) aimed at testing the instruments with a college age sample, thus not taking into account the level of reading proficiency of subjects in their teenage years. For example, the following statements from both instruments may provide some degree of difficulty with a sample of male high school baseball players: "I seem to work in fits and starts or bits and pieces" (TAIS) and, "I seem to work on my hitting in bits and pieces" (B-TAIS). The above statements indicate that an individual may be inconsistent in his/her approach to a work situation in the case of the TAIS, or inconsistent in the approach to improving or practicing batting skills. This type of question may seem obvious to the college population, but equally confusing to the population of teenagers. During the testing sessions, this researcher clarified or interpreted the meaning of statements like the ones stated above for subjects of both Puerto Rico and United States samples. If the case was that of a culturally biased instrument(s), the US sample would not have had any problems interpreting the meaning of such statements as "fits and starts", or "bits and pieces"; the Puerto Rico sample however, would have encountered some difficulty interpreting such colloquialisms which may not be part of their vocabulary. This was not the case, the instruments appeared more age-biased than culturally or ethnically biased as is evident by the pattern of responses plotted as Z-scores

on Figures 3-6. The two non-randomly selected samples (PR, US) responded very similarly on all subscales of both the TAIS and B-TAIS. This would suggest that sampled teenagers from PR and the US are fairly consistent in their approach to answering questions of attentional assessment. Furthermore, if the instrument was culturally biased, it would be expected that the responses of the US sample for the present study would follow closely to those reported by Albrecht's (1986) college sample since both samples are from the same country. The findings of this study as stated above did not find a similar pattern of responses between Albrecht's college sample and the US sample of the present study. Thus, if any bias is to be considered in regards to the TAIS and B-TAIS as instruments that assess attentional style more studies with random samples of college students in Puerto Rico and United States need to be conducted.

Another purpose for conducting the present study was to determine the construct validity of the TAIS and B-TAIS with a population sample of male high school baseball players. Construct validity as explained by Thomas and Nelson (1985) is the degree to which a test measures a hypothetical construct, usually established by relating the test results to some behavior. As mentioned in previous chapters, an essential component of Nideffer's (1976a, 1976b, 1981) theory of attentional style is how the increase of

competitive arousal levels decreases the focus of attention towards the task being performed. Therefore, performance outcomes tend to be affected by the relationship of augmented levels of anxiety and diminished attentional focus. This premise was supported by research conducted by Nideffer (1978) using a sample of collegiate swimmers, and by Courtet and Landers' (1978) sample of rifle team members.

The present study found only partial support for the construct validity of the B-TAIS and TAIS with a population of male teenagers, due to the low correlation coefficients between the attentional instruments and competitive trait anxiety. The results would suggest that Nideffer's model of attentional style (1976a, 1976b, 1981) and its instrument (TAIS) or its derivations (B-TAIS) are reliable and valid when assessing population samples of adult-age, as is evident by previously reported research (Jackson, 1980; Vallerand, 1983). However, little confidence can be placed in these attentional assessment instruments when tested with a population sample of teenagers.

As previously discussed, the instruments (TAIS, B-TAIS) would seem to be biased towards populations of teenagers, and not necessarily culturally biased. The Puerto Rican and United States samples both had some difficulty in terms of context interpretation of some of the questions presented in the TAIS and B-TAIS. Even though the Puerto Rican subjects used in this study view English as their second

language, if the test(s) were culturally biased, subscale scores would have had some degree of significant statistical difference when compared to the United States sample. This was not the case since both groups (PR, US) followed an almost identical pattern of subscale response in both measures of attention (TAIS, B-TAIS). However, the difference in pattern response between Albrecht's (1986) college sample and the present study was very obvious, once again suggesting that the instruments may be more age-biased for populations younger than college adults.

Another challenge to the validity of the TAIS and its batting-specific version (B-TAIS) in this study was the lack of significant positive correlations between contact percentage in baseball and 'effective attentional style'. Nideffer (1981), Van Schoyck and Grasha (1981), and Albrecht (1986) conducted research using college-age samples. Their results indicated significant positive correlations between successful performance outcome and 'effective attentional style'. On the contrary, the findings of this study reported no correlation between performance outcome and 'effective or ineffective attentional style'. The high school sample used in this study produced correlation coefficients between the TAIS and B-TAIS subscales and contact percentage that ranged from -.32 to .20, suggesting a lack of relationship between performance (contact percentage) and focus of attention. However, as stated earlier, past research points

towards the positive relationship that exists between attention and successful performance outcome. Thus, according to the results of the present study it could be assumed that teenage baseball players lack the proper attentional focus needed to successfully perform the skill of batting in the sport of baseball. Obviously, the just mentioned statement contradicts reality. Four of the six varsity baseball teams that participated in this study made it to their conference playoffs, indicating that team members were executing the skill of batting with success, otherwise the teams would not have reached postseason play. The subjects of this study were selected to form part of their school's varsity baseball team, thus indicating that those selected formed part of an elite group of baseball players within their respective institution. Therefore, it is safe to assume that male high school baseball players do use some form of attentional focus in order to successfully execute the task of batting in baseball. Perhaps their cognitive skills are not yet fully developed to properly block-out irrelevant cues that would detract from successful execution of batting in baseball. On the contrary, their college counterparts are older, have more experience, are at a different developmental skill level, and have had more trial and error sessions to master the focus of attention needed to successfully master the skill of batting in baseball. Hence, the reason why the reported results

of Albrecht's (1986) college sample were more indicative of the relationship between contact percentage and attentional styles scores. In contrast, the results of the present study do not support the relationship between attentional style and contact percentage with high school baseball players.

Summary

The present study had three specific purposes: (a) to test the reliability and validity of the TAIS and B-TAIS as attentional assessment instruments with a sample of male high school baseball players, (b) to compare results between Albrecht's (1986) college sample and the high school sample of this study, (c) to investigate if any differences exist between a selected sample of varsity high school baseball players in the United States and Puerto Rico in their performance on the TAIS and B-TAIS.

The results of the present study indicated that the instruments (TAIS, B-TAIS) were not reliable or valid with a sample of male high school baseball players. Furthermore, the comparison of instrument scores between college and high school baseball players produced a sharp contrast in response patterns between the two groups. College baseball players scored closer to the standard norm than the high school players. There were no significant statistical differences to report between the United States and Puerto Rico high school baseball players.

Conclusions

Based upon the findings and within the limitations of this study, the following conclusions were reached:

(1) Overall, the TAIS and the B-TAIS in their present form are neither reliable nor valid when given to a sample of male high school baseball players.

(2) Neither the TAIS nor the B-TAIS are culturally biased instruments when given to population samples that have knowledge and mastery of the English language.

(3) Both the TAIS and the B-TAIS are age-biased due to the nature of the vocabulary used throughout both questionnaires, posing some degree of difficulty for teenagers to interpret the statements that are part of the instruments.

(4) The sample of teenagers from Puerto Rico and the United States used in this study produced no significant statistical difference in relation to the instruments scores that each group received.

Recommendations for Future Research

The direction of future research in the area of attentional focus within a sport context should continue to expand. Researchers should continue to develop sport-specific instruments that assess focus of attention, however, more specifically, instruments that are age-appropriate for different samples in our population. This would increase the reliability and validity of the instruments, thus allowing researchers to test their theories as well as identify athletes of different ages that may be heading towards an elite status, or athletes in need of assistance for conquering cognitive strategies that may enhance success in performance.

Future researchers should also conduct investigations

with large populations of randomized samples of different cultural backgrounds. This will expose cultural similarities and differences that may exist among different population samples found in the US. This may provide a better understanding of our diversified society.

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APPENDICES

APPENDIX A

TEST OF ATTENTIONAL AND INTERPERSONAL STYLE

Robert M. Nideffer, Ph.D.

INSTRUCTIONS

USE PENCIL DO NOT WRITE ON THE TEST BOOKLET

Read each item carefully and then answer according to the frequency with which it describes you or your behavior. For example, item 1 is "When people talk to me, I find myself distracted by the sights and sounds around me."

1 = NEVER
2 = RARELY
3 = SOMETIMES
4 = FREQUENTLY
5 = ALWAYS

If your answer to the first item is SOMETIMES, you would circle with a pencil #3 for item number 1. The same key is used for every item, thus each time you circle #1 you are indicating NEVER, etc.

1. Please be sure to write your subject code, birth date, and high school on the answer sheet.
2. There are no right or wrong answers, but honesty in your answer is the best response.
3. Do not spend too much time on any one statement, but choose the answer which describes your behavior or feelings.

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Behavioral Research Applications Group, Inc.
622 Harvard Street, Rochester, New York 14607

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 read it is easy to block out everything but the book.

13. I focus on one small part of what a person says and miss the total message.

14. I have difficulty clearing my mind of a single thought or idea.

15. I think about one thing at a time.

16. I get caught up in my thoughts and become oblivious to what is going on around me.

17. I theorize and philosophize.

18. My environment is exciting and keeps me involved.

19. My interests are broader than most people's.

20. My interests are narrower than most people's.

21. It is easy for me to direct my attention and focus narrowly on something.

22. It is easy for me to focus on a number of things at the same time.

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

24. It is easy for me keep sights and sounds from interfering with my thoughts.

25. Happenings or objects grab my attention.

26. It is easy for me to keep my mind on a single thought or idea.

27. I am good at picking a voice or instrument out of a piece of music that I am listening to.

28. With so much going on around me, it's difficult for me to think about anything for any length of time.

29. 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.

30. At stores I am faced with so many choices I can't make up my mind.

31. When I get anxious or nervous my attention becomes narrow and I fail to see important things that are going on around me.

32. In a room filled with children or out on a playing field, I know what everyone is doing.

33. It is easy for me to keep my mind on a single sight or sound.

34. I am good at rapidly scanning crowds and picking out a particular person or face.

35. 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.

36. I have so many things on my mind that I become confused and forgetful.

37. On essay tests my answers are (were) too narrow and don't cover the topic.

38. It is easy for me to forget about problems by watching a good movie or by listening to music.

39. In games I make mistakes because I am watching what one person does and forget about the others.

40. I can plan several moves ahead in complicated games like bridge and chess.

41. In a roomful of people I can keep track of several conversations at the same time.

42. I have difficulty telling how others feel by watching them and listening to them talk.

43. People have to repeat things to me because I become distracted by irrelevant sights or sounds around me.

44. On essay tests my answers are (were) too broad, bringing in irrelevant information.

45. I make mistakes because my thoughts get stuck on one idea or feeling.

46. I get confused at busy intersections.

47. I am good at glancing at a large area and quickly picking out several objects, such as those hidden figure drawings in children's magazines.

48. I get anxious and block out everything on tests.

49. Even when I'm involved in a game or sport, my mind is going a mile a minute.

50. I can figure out how to respond to others just by looking at them.

51. 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.

52. It is easy for me to bring together ideas from a number of different areas.

53. Sometimes lights and sounds come at me so rapidly they make me light headed or dizzy.

54. People have to repeat things because I get distracted by my own irrelevant thoughts.

55. 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.

56. I can spend a lot of time just looking at things with my mind a complete blank except for reflecting the things that I see.

57. I am socially outgoing.

58. I have a lot of energy for my age.

59. I am always on the go.

APPENDIX B

B-TAIS ITEMS AND SCORING INSTRUCTIONS

R.R. Albrecht & D.L. Feltz (1987)

1. I am good at glancing at the positioning of the defense, and quickly picking out where the ball should be hit.
2. It is easy for me to focus on a number of things at the same time while I bat.
3. When I bat, I have so many things on my mind that I get confused and forget my instructions.
4. When batting, I keep changing back and forth from one stance and grip to another.
5. When in the batter's box my mind is going a mile a minute.
6. I find myself in the batter's box just looking at the pitcher with my mind a complete blank.
7. I tend to focus on one small part of a pitcher's delivery, and miss those things that may give me a better idea of what (s)he is throwing me.
8. When I get anxious or nervous while hitting, my attention becomes narrow and I fail to see important cues that are going on around me.
9. When hitting, I can keep track of several things at the same time, such as the count, the coaches' instructions, and the type of pitch that I am most likely to see.
10. When I am batting, I find myself distracted by the sights and sounds around me.
11. When batting, I only think about on thing at a time.
12. When asked by my teammates what a given pitcher is throwing, my answers are too narrow, and don't give them the information they are looking for.
13. I need to have all information regarding a certain pitcher before I know how to hit against him/her.
14. My interests in hitting are narrower than are those of most players.
15. I make mistakes while batting because my thoughts get stuck on one idea or feeling.
16. I have a lot of energy for a hitter my age.
17. I have difficulty telling what a pitcher is thinking by watching his/her moves.
18. When batting, I have a tendency to listen to the catcher or the infielder's chatter and forget about the upcoming pitch.
19. When I get up to bat, I get anxious and forget what it was I was going to try to do against this particular pitcher.
20. Pitchers can fool me by throwing a type of pitch that I'm not expecting or by using an unorthodox motion.

21. With so much going on around me as I bat, it is difficult for me to keep my concentration for any length of time.

22. When up to the plate, I know what everyone in the field is doing.

23. While batting, my thoughts are limited to just the pitcher and the ball.

24. I am good at picking up the rotation of the ball after it leaves the pitcher's hand.

25. While hitting, my thoughts are coming to me so fast that I can hardly keep up with them.

26. Hitting a baseball is a skill which involves a wide variety of seemingly unrelated tasks and strategies.

27. It is easy for me to consider the various aspects of the game such as the score, the number of base runners, the outs, and the count, and from this, get a good idea of what to do when I get up to the plate.

28. It is easy for me to keep my mind on the single thought of hitting the baseball.

29. Just by watching a pitcher warm-up, or throw to one of my teammates, I can figure out how to hit him/her.

30. While batting, I make mistakes because I get too involved with what one player is doing, and forget about the others.

31. I approach the mental aspects of hitting in a focused, narrow, and logical fashion.

32. While batting, outside happenings or objects tend to grab my attention.

33. I think a lot about different batting strategies and tactics.

34. After I bat, and my teammates ask me about what the pitcher has thrown me, my answers are too broad, and I tell them more than they really need to know.

35. When I'm batting, the diamond seems to be a booming, buzzing, brilliant flash of color and confusion.

36. My interests in hitting are broader than those of most players.

37. I am good at quickly analyzing a pitcher and assessing his/her strengths and weaknesses.

38. It is easy for me to keep my mind on the single sight of the ball approaching the plate.

39. When I am preparing to bat, I am good at analyzing complex situations such as what should be done given the score, the number of outs, runners on base, etc.

40. It is easy for me to keep outside sights and sounds from interfering with my thoughts while I'm hitting.

41. When batting, I get so caught up in my own thoughts I forget what's going on around me.

42. When a pitcher is trying to "set me up" I can think several moves ahead, and see what (s)he's doing.

43. I am socially outgoing, talking to the catcher and/or umpire while I bat.

44. When I'm batting, I find myself distracted by my own thoughts and ideas.

45. Batting is exciting, and keeps me interested.

46. I am always on the move in the batter's box.

47. It is easy for me to forget about an error that I have made in the field when I'm hitting.

48. When I'm hitting, if the coach doesn't give me a signal, I can't make up my mind on what strategy to use.

49. It is easy for me to direct my attention and focus narrowly while I bat.

50. I seem to work on my hitting in "fits and starts" and "bits and pieces".

51. All I need is a little information about opposing pitchers, and I can think of a number of ways I can go about trying to hit them.

52. When I bat, it is easy for me to block out everything except the ball.

53. When hitting, I have difficulty clearing my mind of a single thought or idea.

54. Sometimes while hitting, the developments in the game come so fast that it makes me light headed or dizzy.

55. It is easy for me to keep my thoughts from interfering with my hitting while I'm at the plate.

56. When the pitcher has a wide variety of different pitches, I get confused as to which one to expect.

57. I sometimes have to step out of the batter's box because I get distracted by irrelevant sights and sounds.

58. I get confused trying to bat with so many things happening all at the same time.

59. The coach has to repeat the signs beçause I get distracted by my own irrelevant thoughts when I prepare to bat.

B-TAIS Scoring Procedures

All B-TAIS items are scored: 0 = never; 1 = rarely; 2 = sometimes; 3 = frequently; 4 = always. The following items are included in each subscale score:

BET: 1, 22, 29, 37, 39; and **17 (reverse scored)**
OET: 4, 10, 21, 32, 35, 48, 50, 54, 56, 57, 58; and **40 (reverse scored)**
BIT: 2, 27, 33, 36, 39, 42, 51; and **30 (reverse scored)**
OIT: 3, 18, 20, 25, 34, 41, 44, 59; and **55 (reverse scored)**
NAR: 11, 14, 23, 24, 28, 31, 38, 47, 49, 52, 55
RED: 6, 7, 8, 11, 12, 13, 15, 18, 19, 23, 30, 31, 47, 53; and **2 (reverse scored)**
INFP: 1, 2, 5, 9, 16, 22, 26, 33, 36, 37, 39, 42, 43, 45, 46, 51; and **7, 11, 23 (reverse scored)**

APPENDIX C

ILLINOIS COMPETITION QUESTIONNAIRE

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

1. Competing against others is socially enjoyable.	1 hardly ever	2 sometimes	3 often
2. Before I compete I feel uneasy.	1 hardly ever	2 sometimes	3 often
3. Before I compete I worry about not performing well.	1 hardly ever	2 sometimes	3 often
4. I am a good sportsman when I compete.	1 hardly ever	2 sometimes	3 often
5. When I compete I worry about making mistakes.	1 hardly ever	2 sometimes	3 often
6. Before I compete I am calm.	1 hardly ever	2 sometimes	3 often
7. Setting a goal is important when competing.	1 hardly ever	2 sometimes	3 often
8. Before I compete I get a queasy feeling in my stomach.	1 hardly ever	2 sometimes	3 often
9. Just before competing I notice my heart beats faster than usual.	1 hardly ever	2 sometimes	3 often
10. I like to compete in games that demand considerable physical energy.	1 hardly ever	2 sometimes	3 often
11. Before I compete I feel relaxed.	1 hardly ever	2 sometimes	3 often
12. Before I compete I am nervous.	1 hardly ever	2 sometimes	3 often
13. Team sports are more exciting than individual sports.	1 hardly ever	2 sometimes	3 often
14. I get nervous waiting to start the game.	1 hardly ever	2 sometimes	3 often
15. Before I compete I usually get uptight.	1 hardly ever	2 sometimes	3 often

APPENDIX D

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

	Not At All	Somewhat	Moderately So	Very Much So
1. I am concerned about this competition	1	2	3	4
2. I feel nervous	1	2	3	4
3. I feel at ease	1	2	3	4
4. I have self-doubts	1	2	3	4
5. I feel jittery	1	2	3	4
6. I feel comfortable	1	2	3	4
7. I am concerned that I may not do as well in this competition as I could	1	2	3	4
8. My body feels tense	1	2	3	4
9. I feel self-confident	1	2	3	4
10. I am concerned about losing	1	2	3	4
11. I feel tense in my stomach	1	2	3	4
12. I feel secure	1	2	3	4
13. I am concerned about choking under pressure	1	2	3	4
14. My body feels relaxed	1	2	3	4
15. I'm confident I can meet the challenge	1	2	3	4
16. I'm concerned about performing poorly	1	2	3	4
17. My heart is racing	1	2	3	4
18. I'm confident about performing well	1	2	3	4
19. I'm worried about reaching my goal	1	2	3	4
20. I feel my stomach sinking	1	2	3	4
21. I feel mentally relaxed	1	2	3	4
22. I'm concerned that others will be disappointed with my performance	1	2	3	4
23. My hands are clammy	1	2	3	4
24. I'm confident because I mentally picture myself reaching my goal	1	2	3	4
25. I'm concerned I won't be able to concentrate	1	2	3	4
26. My body feels tight	1	2	3	4
27. I'm confident of coming through under pressure	1	2	3	4

APPENDIX E

SUBJECT BACKGROUND QUESTIONNAIRE

Subject Code_____ **Date of Birth**__/__/__
Initials of first/last name Mo/Day/Yr

High School_____ **Year in school** Fr So Jr Sr
(circle year)

Ethnic Back Ground: ____Caucasian ____African-American ____Hispanic
____Asian-American ____Other (specify)_____

Have you played organized sports prior to this year?

____Yes ____No

List the organized sports (coaches provided for teams) in which you have participated, and your age at the time of participation. (e.g., baseball--8 to 12 yrs.)

How many years have you played organized baseball, counting this one?

On a scale of 1 to 10, rate your ability in baseball? (circle your answer)

1 2 3 4 5 6 7 8 9 10
very poor **average** **excellent**

What is your overall satisfaction with playing baseball? (circle your answer)

Very satisfied Somewhat Not at all

5 4 3 2 1

What position(s) do you play on your baseball team?

Do you average 4 innings or more of playing time per baseball game? ____Yes ____No

TURN PAGE

Rank order your strengths as a baseball player.
(i.e., 1 batting, 2 pitching... 15 bunting)

____batting	____pitching	____bunting
____running bases	____catching in general	____throwing
____switch hitting	____covering bases on defense	____knowing the coach's hand signals
____place hitting	____catching grounders	____catching fly balls
____hittting sliders	____hitting fast balls	____hitting curves

APPENDIX F

INFORMED CONSENT FORM
FOR PARENTS OF
HIGH SCHOOL BASEBALL PLAYERS

The purpose of this study is to assess the concentration skills of high school baseball players. The two surveys that will be used will determine the subject's concentration style, and consequently performance may be predicted from the athlete's ability to concentrate.

All responses will remain confidential. Please be assured that your son's data will only be presented in summary or group form.

In order for your son to be a part of this study, we must have your consent for your son to participate. Please communicate the content of this consent form to your son before giving your consent for his participation.

INFORMED CONSENT
The study and my son's part in the study, have been defined and explained to me, and my son understands the explanation. I understand that my son's participation in this study does not guarantee any beneficial results to me or my child. I understand that there are no known risks involved in completing the surveys. I understand that any data or answers to questions will remain confidential with regard to my son's identity. I further understand that my son may discontinue his participation at any time without penalty or prejudice.

I hereby agree to allow my son,_____,to participate as a volunteer in this study.

_____ _____
Parent/Legal Guardian Date

I understand my rights as a participant in this study and do agree to participate as a volunteer.

_____ _____
Study Participant Date

APPENDIX G

APPENDIX G

Summary of t-tests between the Puerto Rico and United States Samples

Subscales	Puerto Rico M	Puerto Rico SD	United States M	United States SD	t value	Prob.
SCAT Score	19.1	2.6	19.5	3.4	-.36	.719
CSAI-2						
Cognitive	21.3	5.1	21.1	6.5	.11	.916
Somatic	18.8	4.1	17.3	5.7	.23	.847
Confidence	26.7	5.9	26.6	6.1	.05	.957
TAIS						
BET	12.3	2.1	12.6	1.7	-.52	.605
OET	19.8	2.1	20.0	4.6	-.15	.881
BIT	15.3	2.6	17.2	2.1	-2.95	.005*
OIT	16.7	4.7	17.3	4.3	-.48	.687
NAR	23.7	2.8	23.2	4.4	.45	.656
RED	26.6	4.1	28.7	4.6	-1.60	.116
INFP	42.1	7.7	45.1	4.8	-1.74	.088
B-TAIS						
BET	14.4	2.2	13.8	2.7	.75	.458
OET	18.1	4.8	18.4	4.1	-.31	.757
BIT	17.3	2.9	17.8	3.1	-.53	.596
OIT	13.5	4.6	14.0	3.1	-.44	.663
NAR	24.9	5.1	24.5	4.6	.28	.784
RED	24.0	4.7	26.6	5.7	-1.66	.102
INFP	43.0	6.1	42.1	6.1	.49	.629

* $p < .05$

APPENDIX H

APPENDIX H

Z-scores of TAIS and B-TAIS Subscales

Attentional Subscale	TAIS Z-score	B-TAIS Z-score
Puerto Rico		
BET	-.658	.205
OET	.532	.914
BIT	-.841	.148
OIT	1.250	.582
NAR	-.796	-.950
RED	.483	.172
United States		
BET	-.555	.024
OET	.590	.990
BIT	-.225	.273
OIT	1.440	.720
NAR	-.891	-1.000
RED	1.050	.612
Total Sample		
BET	-.593	.083
OET	.565	.964
BIT	-.440	.228
OIT	1.371	.670
NAR	-.861	-.987
RED	.854	.461

APPENDIX I

April 5, 1993

TO: David E. Wright, Chair
UCRIHS

APR 0 5 1993

FROM: 2nd comment, Reviewer #1

RE: IRB# 93-046

INVESTIGATOR(S): EWING, Martha E. (Colon, Geffrey)

TITLE: RELATIONSHIPS BETWEEN ATTENTIONAL STYLE, COMPETITIVE ANXIETY, AND PERFORMANCE OF MALE HIGH SCHOOL PLAYERS

The investigator has made the changes needed for approval of the project except for a minor modification in wording. If subjects are asked to put their initials and birth date on all instruments and questionnaires, the data can not be considered as "anonymous". Only the second paragraph of the information/consent page needs modification and this might be achieved simply by deletion, eg "All responses will remain confidential. Please be assured that your son's data will only be presented in summary or group form". (suggested revision only).

If change(s) are made to indicate confidentiality rather than anonymity, I would recommend approval of the project.

APPENDIX J

GC-BASEBALL

Variable	Variable name	Values	Col #
ID	ID #		1-3
Age	subject age	Rec. # 99=missing	4-5
Race	subject race	1=caucasian 2=black 3=hispanic 4=asian 5=other 9=missing	6
HS	High School	1=AHS 2=CSJ 3=CSI 4=Perry 5=Holt 6=LCC	7
Year	Year in School	1=Fresh 2=Soph 3=Junior 4=Senior 9=missing	8
PlaySpr	Play-Org-Sports	1=yes 2=no	9
NumSpr	Number Sports Played	Rec. # 99=missing	10-11
YrsPlay	Yrs-Play-BBall	Rec. # 99=missing	12-13
RatAbil	Perceived Ability	1=very poor 3=poor 5=avg. 7=above avg. 10=excellent 99=missing	14-15
Satisfac	Satisfaction BBall	1=not at all 2=doubtful 3=somewhat 4=satisfied 5=very satisfied 9=missing	16
Position	Position(s) played	Rec. # 99=missing	17
AvgInn	Avg Innings per Game	1=4 or more 2=0-3 innings 9=missing	18
Rankbat	Rank batting	Rec. #	19-20
Runbase	Running bases	same	21-22
Swihit	Switch hitting	same	23-24
Plahit	Place hitting	same	25-26
hitsli	Hitting sliders	same	27-28
Pitch	Pitching	same	29-30
Catch	Catching in general	same	31-32
Covdef	Covering bases on def.	same	33-34

Catchgro	Catching grounders	same	35-36
Hitfast	Hitting fast balls	same	37-38
Bunt	Bunting	same	39-40
Throw	Throwing	same	41-42
Knosig	Know hand signals	same	43-44
Catfly	Catching fly balls	same	45-46
Hitcur	Hitting curves	same	47-48
PRSCAT1	Enjoy Competition	1=hardly ever 2=sometimes 3=often 9=missing	49
PRSCAT2	Uneasy competing	same	50
PRSCAT3	Worry performance	same	51
PRSCAT4	Good sport	same	52
PRSCAT5	Worry mistakes	same	53
PRSCAT6	Calm before Comp	same	54
PRSCAT7	Goal setting	same	55
PRSCAT8	Queasy stomach	same	56
PRSCAT9	Fast heartbeat	same	57
PRSCAT10	Hi Phy Energy	same	58
PRSCAT11	Relax Competition	same	59
PRSCAT12	Nervous Competition	same	60
PRSCAT13	Team sports exciting	same	61
PRSCAT14	Nervous waiting	same	62
PRSCAT15	Uptight competition	same	63
POSCAT1	same PRSCAT	same PRSCAT	64
POSCAT2	same	same	65
POSCAT3	same	same	66
POSCAT4	same	same	67
POSCAT5	same	same	68
POSCAT6	same	same	69
POSCAT7	same	same	70
POSCAT8	same	same	71
POSCAT9	same	same	72
POSCAT10	same	same card 2	1
POSCAT11	same	same	2
POSCAT12	same	same	3
POSCAT13	same	same	4
POSCAT14	same	same	5
POSCAT15	same	same	6
POCSAI1	Concerned Comp.	1=not at all 2=somewhat 3=moderately so 4=very much so	7
POCSAI2	Nervous	same	8
POCSAI3	At ease	same	9
POCSAI4	Self-doubts	same	10
POCSAI5	Jittery	same	11
POCSAI6	Comfortable	same	12
POCSAI7	May not do well	same	13

POCSAI8	Body feels tense	same	14
POCSAI9	Self-confident	same	15
POCSAI10	Concerned losing	same	16
POCSAI11	Tense in tummy	same	17
POCSAI12	Secure	same	18
POCSAI13	Choking	same	19
POCSAI14	Relaxed	same	20
POCSAI15	Confident challenge	same	21
POCSAI16	Poor performance	same	22
POCSAI17	Fast heart beat	same	23
POCSAI18	Confident good perf.	same	24
POCSAI19	Worried about goal	same	25
POCSAI20	Sinking stomach	same	26
POCSAI21	Mentally relaxed	same	27
POCSAI22	Disappointed perf.	same	28
POCSAI23	Clammy hands	same	29
POCSAI24	Reaching goal	same	30
POCSAI25	Cant concentrate	same	31
POCSAI26	Body feels tight	same	32
POCSAI27	Perf. under pressure	same	33
PRTAIS1	Distracted sounds	0=never 1=rarely 2=sometimes 3=frequently 4=always 9=missing	34
PRTAIS2	Distracted thoughts	same	35
PRTAIS3	Little info + ideas	same	36
PRTAIS4	Limited thoughts	same	37
PRTAIS5	All informationg	same	38
PRTAIS6	Focus & narrow	same	39
PRTAIS7	Back and forth	same	40
PRTAIS8	Fits & starts	same	41
PRTAIS9	Unrelated ideas	same	42
PRTAIS10	Rapid Thoughts	same	43
PRTAIS11	World of confusion	same	44
PRTAIS12	Block out everything	same	45
PRTAIS13	Miss message	same	46
PRTAIS14	Hard to clear mind	same	47
PRTAIS15	Think one thing	same	48
PRTAIS16	Involved in thoughts	same	49
PRTAIS17	Theory & philosphize	same	50
PRTAIS18	Exciting environment	same	51
PRTAIS19	Broad interest	same	52
PRTAIS20	Narrow interest	same	53
PRTAIS21	" focus	same	54
PRTAIS22	Easy to focus	same	55
PRTAIS23	No interfering	same	56
PRTAIS24	"	same	57
PRTAIS25	Attention	same	58
PRTAIS26	Easy to have 1 idea	same	59
PRTAIS27	Pick voice	same	60
PRTAIS28	Diff. to think	same	61
PRTAIS29	Complex situations	same	62

PRTAIS30	Many choices	same		63
PRTAIS31	Narrow attention	same		64
PRTAIS32	Know everything	same		65
PRTAIS33	Easy to concentrate	same		66
PRTAIS34	Scan crowds	same		67
PRTAIS35	Confused	same		68
PRTAIS36	Many things on mind	same		69
PRTAIS37	Narrow answers	same		70
PRTAIS38	Forget problems	same		71
PRTAIS39	Make mistakes	same		72
PRTAIS40	Plan moves	same	card 3	1
PRTAIS41	Keep track	same		2
PRTAIS42	Others feel	same		3
PRTAIS43	Repeat things	same		4
PRTAIS44	Broad answers	same		5
PRTAIS45	Make mistakes	same		6
PRTAIS46	Get confused	same		7
PRTAIS47	Pick out objects	same		8
PRTAIS48	Get anxious	same		9
PRTAIS49	Racing mind	same		10
PRTAIS50	Respond to others	same		11
PRTAIS51	Forget things	same		12
PRTAIS52	Bring together ideas	same		13
PRTAIS53	Light headed	same		14
PRTAIS54	Distracted by thoughts	same		15
PRTAIS55	Wool over eyes	same		16
PRTAIS56	Lots of time	same		17
PRTAIS57	Socially outgoing	same		18
PRTAIS58	Lots of energy	same		19
PRTIAS59	On the go	same		20
POTAIS1		same		21
POTAIS2		same		22
POTAIS3		same		23
POTAIS4		same		24
POTAIS5		same		25
POTAIS6		same		26
POTAIS7		same		27
POTAIS8		same		28
POTAIS9		same		29
POTAIS10		same		30
POTAIS11		same		31
POTAIS12		same		32
POTAIS13		same		33
POTAIS14		same		34
POTAIS15		same		35
POTAIS16		same		36
POTAIS17		same		37
POTAIS18		same		38
POTAIS19		same		39
POTAIS20		same		40
POTAIS21		same		41
POTAIS22		same		42
POTAIS23		same		43
POTAIS24		same		44

POTAIS25	same		45
POTAIS26	same		46
POTAIS27	same		47
POTAIS28	same		48
POTAIS29	same		49
POTAIS30	same		50
POTAIS31	same		51
POTAIS32	same		52
POTAIS33	same		53
POTAIS34	same		54
POTAIS35	same		55
POTAIS36	same		56
POTAIS37	same		57
POTAIS38	same		58
POTAIS39	same		59
POTAIS40	same		60
POTAIS41	same		61
POTAIS42	same		62
POTAIS43	same		63
POTAIS44	same		64
POTAIS45	same		65
POTAIS46	same		66
POTAIS47	same		67
POTAIS48	same		68
POTAIS49	same		69
POTAIS50	same		70
POTAIS51	same		71
POTAIS52	same		72
POTAIS53	same	card 4	1
POTAIS54	same		2
POTAIS55	same		3
POTAIS56	same		4
POTAIS57	same		5
POTAIS58	same		6
POTAIS59	same		7
PBTAIS1	same		8
PBTAIS2	same		9
PBTAIS3	same		10
PBTAIS4	same		11
PBTAIS5	same		12
PBTAIS6	same		13
PBTAIS7	same		14
PBTAIS8	same		15
PBTAIS9	same		16
PBTAIS10	same		17
PBTAIS11	same		18
PBTAIS12	same		19
PBTAIS13	same		20
PBTAIS14	same		21
PBTAIS15	same		22
PBTAIS16	same		23
PBTAIS17	same		24
PBTAIS18	same		25
PBTAIS19	same		26

PBTAIS20	same		27
PBTAIS21	same		28
PBTAIS22	same		29
PBTAIS23	same		30
PBTAIS24	same		31
PBTAIS25	same		32
PBTAIS26	same		33
PBTAIS27	same		34
PBTAIS28	same		35
PBTAIS29	same		36
PBTAIS30	same		37
PBTAIS31	same		38
PBTAIS32	same		39
PBTAIS33	same		40
PBTAIS34	same		41
PBTAIS35	same		42
PBTAIS36	same		43
PBTAIS37	same		44
PBTAIS38	same		45
PBTAIS39	same		46
PBTAIS40	same		47
PBTAIS41	same		48
PBTAIS42	same		49
PBTAIS43	same		50
PBTAIS44	same		51
PBTAIS45	same		52
PBTAIS46	same		53
PBTAIS47	same		54
PBTAIS48	same		55
PBTAIS49	same		56
PBTAIS50	same		57
PBTAIS51	same		58
PBTAIS52	same		59
PBTAIS53	same		60
PBTAIS54	same		61
PBTAIS55	same		62
PBTAIS56	same		63
PBTAIS57	same		64
PBTAIS58	same		65
PBTAIS59	same		66
BTAISP1	same		67
BTAISP2	same		68
BTAISP3	same		69
BTAISP4	same		70
BTAISP5	same		71
BTAISP6	same		72
BTAISP7	same	card 5	1
BTAISP8	same		2
BTAISP9	same		3
BTAISP10	same		4
BTAISP11	same		5
BTAISP12	same		6
BTAISP13	same		7
BTAISP14	same		8

BTAISP15	same	9
BTAISP16	same	10
BTAISP17	same	11
BTAISP18	same	12
BTAISP19	same	13
BTAISP20	same	14
BTAISP21	same	15
BTAISP22	same	16
BTAISP23	same	17
BTAISP24	same	18
BTAISP25	same	19
BTAISP26	same	20
BTAISP27	same	21
BTAISP28	same	22
BTAISP29	same	23
BTAISP30	same	24
BTAISP31	same	25
BTAISP32	same	26
BTAISP33	same	27
BTAISP34	same	28
BTAISP35	same	29
BTAISP36	same	30
BTAISP37	same	31
BTAISP38	same	32
BTAISP39	same	33
BTAISP40	same	34
BTAISP41	same	35
BTAISP42	same	36
BTAISP43	same	37
BTAISP44	same	38
BTAISP45	same	39
BTAISP46	same	40
BTAISP47	same	41
BTAISP48	same	42
BTAISP49	same	43
BTAISP50	same	44
BTAISP51	same	45
BTAISP52	same	46
BTAISP53	same	47
BTAISP54	same	48
BTAISP55	same	49
BTAISP56	same	50
BTAISP57	same	51
BTAISP58	same	52
BTAISP59	same	53
ATBAT	# times at bat	54-56
BATPERC	batting %	57-59
CONTACT	contact %	60-62
SINGLES	hits	63-64
DOUBLES	"	65-66
TRIPLES	"	67-68
HR	homers	69-70
ERRORS		71-72

APPENDIX K