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THE BASKETBALL TEST OF ATTENTIONAL AND INTERPERSONAL STYLE

by

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ABSTRACT

Attentional style has been identified as an important skill in athletic performance. Recently, Nideffer (1973) devised a self-report Test of Attentional and Interpersonal Style (TAIS) to measure this attribute. However, Nideffer's TAIS (N-TAIS) has been criticized for not being able to distinguish between the attentional profiles of different caliber athletes in sport. This was demonstrated in studies by Vallerand (1983), Kirschenbaum & Bale (1980) and Van Schoyck & Grasha (1981). The results of these studies strongly suggested that a sport specific version of N-TAIS is needed. This study involves designing and validating a basketball version of N-TAIS which will assist basketball coaches in assessing the attentional strengths and weaknesses of their athletes.

Ninety female basketball players served as subjects. Thirty were from University basketball teams and were considered the "elite" group. Sixty subjects were from a high-school basketball team, thirty of which were considered the "superior" group (the better players) and the remaining thirty were considered the "average" group (the weaker players).

The results indicate that the B-Ball TAIS is a reliable test. It confirmed the direction dimension of attentional style and demonstrated some support for the breadth dimension. Construct validity was found to exist for some but not all of the subscales of the B-Ball TAIS. The B-Ball TAIS also demonstrated some predictive validity in three of seven subscales. N-TAIS demonstrated similar predictive validity but on a different combination of subscales. The B-Ball TAIS demonstrated a more consistent relationship to basketball ability than N-TAIS.

It is recommended that the B-Ball TAIS be used with committed athletes who already have attained a higher level of basketball skills. It is suggested that the B-Ball TAIS would yield it's best results in a councilling situation. Future research in this area could include an increase in items on all of the subscales in order to tap all the situations which occur on the basketball court. However, it was recognized that the disadvantage of a larger instrument is that it is less practical in applied settings.

CONTENTS

Chapter I

1.1 INTRODUCTION

The psychological aspect of sports performance has become an increasing area of interest (Fisher, 1982). Although most published articles focus on the elite athletes at the National or International level, sport psychologists have recommended mental skills training with young people (Botterill, 1986). One of the skills that is important to control in athletics is selective attention. A persons ability to control attention and direct it to task relevant cues opposed to irrelevant cues will determine one's performance (Nideffer, 1983b).

As situations change in sport, one's focus of attention must change appropriately. For example, a basketball player shooting a free-throw must narrow his focus of attention on the target and park all distractors in order to maintain optimal performance. Thus, inappropriate attentional focus will result in inconsistant athletic performance. The measurement of the attentional style of an athlete provides valuable information in terms of helping one identify their strengths and weaknesses. Nideffer (1973) has devised a testing instrument to measure attentional style and has

named it the Test of Attentional and Interpersonal Style (N-TAIS). The test is a self-report pencil and paper inventory with six subscales measuring attentional style which can be related to a sports situation. One of the criticisms of this test is that it does not have the sensitivity to measure change in mental skills (Botterill, 1986). It has been suggested that the design of a sport specific TAIS would assist in this measurement (Van Schoyck & Grasha, 1981). Nideffer's (1973) TAIS has been criticized by others, as well, for not being able to distinguish between the attentional profiles of different caliber athletes in sport. This has been demonstrated in studies on basketball (Valleraand, 1983) and golf (Kirschenbaum & Bale, 1980). The major implication of this criticism have been further support for a sport specific instrument. In answer to this research direction, a tennis TAIS (T-TAIS) was developed (Van Schoyck & Grasha, 1981). This test was found to be a more reliable and valid test of measuring attentional style among tennis players. This study involves designing and validating a basketball version of N-TAIS which will assist basketball coaches in assessing the attentional strengths and weakneses of their athletes.

1.2 STATEMENT OF THE PROBLEM

The purpose of this study was to design and validate a basketball version of N-TAIS, in response to the need for a sport specific instrument. It is suggested that this version would allow an accurate identification of Attentional Style strengths and weaknesses in basketball players. This would be done by measuring each attentional subscale and identifying good scores and poor scores. Specific mental training would then be recommended based on the identified weaknesses. One example of mental training may include learning how to narrow your focus of attention through various exercises. The basketball version of N-TAIS (B-Ball TAIS) would also help distinguish between athletes of different caliber. Goldberg (1972) has stated that the field of psychological assessment has three major goals (a) the finding of important individual differences (b) the best way to measure these differences and (c) the utilization of these measures towards theoretical and applied purposes. Two of the objectives of this study adhere to the first two goals of psychological research. The third goal involves using the test for selection and will be adhered to with less emphasis than the first two goals. One of the major problems with psychological tests is the lack of predictive validity. Other problems are: the athletes will fake their answers in order to look good or they will fake bad answers in order to get the coaches sympathy. The use of the B-Ball

TAIS will be directed to University athletes or commmitted athletes, in general, after the team has been selected. Psychological testing should still remain optional because the willingness of the athlete is necessary for accurate results and progress (Botterill, 1986). The creation of a B-Ball TAIS may encourage coaches to incorporate mental training into their practices. Often if something can be measured, improved upon and then measured again showing improvement, coaches and athletes are more likely to priorize their time to psychological training. Nideffer has published an extensive program in attention control training (ACT) as one example of psychological training (Pratt & Nideffer, 1981).

1.3 HYPOTHESES

1. The subscales for the B-Ball TAIS have significant reliability coefficients.
2. The average reliability coefficient for the B-Ball TAIS will be greater than the reliability coefficient of N-TAIS.
3. The B-Ball TAIS demonstrates that a correlation exists between the rank order of the players (based on caliber) and scores on the test subscales as calculated by the Spearman Rho.
4. The B-Ball TAIS will have a higher correlation than N-TAIS as calculated by the Spearman Rho. Specifically, the correlation is between the rank order of the players (based on caliber) and scores on the test subscales.

5. The B-Ball TAIS distinguishes between the caliber of the three groups of basketball players using the Wilcoxon Rank Sum Test.

6. The B-Ball TAIS demonstrates a more consistent relationship to basketball ability than N-TAIS.

1.4 LIMITATIONS

(a) the final B-Ball-TAIS was restricted to basketball players as the test is sport specific.

(b) the results are limited to the reliability, construct validity and predictive validity of the test.

1.5 DELIMITATIONS

(a) the study is limited to the use of one test instrument as a criterion for the validation of the B-Ball TAIS.

(b) the study sample is limited to female basketball players.

1.6 DEFINITION OF TERMS

Attention

Attention refers to the concentration of an individual on critical features.

Attentional Style

Attentional style refers to the focus of attention of an individual (i.e. broad; wide span of attention, narrow; filtering out a great deal of information, internal; focusing of thoughts and feelings and external; tending to the environment, as defined by Nideffer, 1976).

Chapter II

REVIEW OF RELATED LITERATURE

2.1 INTRODUCTION

The following literature review on attention is initiated by presenting the components of attention and the relevant theories on this topic. Nideffer's contribution to the theory of attention is also included in this section. A section follows that includes the effects of anxiety on attention as the interaction of these two are critical to sport situations. Details of Nideffer's Test of Attentional and Interpersonal Style (TAIS) will be presented followed by the last section covering support and criticisms directed at the TAIS, thus leading to the purpose of this study.

2.2 DEFINITION OF ATTENTION

Wachtel (1967) believed that past definitions of attention did not include the complexity of the experience and therefore were too general in scientific terms. For example, attention has the components of broadness in terms of high scanning ability but is complicated by the degree to which the person sees everything in her path. Narrowness is a focused style of attention which can be represented by re-

duced scanning, narrowing of the beam or greater field articulation. Reduced scanning occurs when the individual focuses on certain features of the field most of the time, instead of sampling many aspects. The narrowing of the beam would result in a reduction in the amount of information handled in an integrated fashion. The last type of narrowing would occur in a figure ground task where the individual has to ignore the ground in order to see the figure. Thus, selectively directing attention to relevant rather than irrelevant stimuli.

The need for further refinement of the term was undertaken in a study by Posner & Boies (1971). Attention was divided into three components; alertness, selectivity and processing capacity. Alertness was the ability to develop and maintain an optimal sensitivity to external stimulation. Selectivity was the ability to choose relevant information from irrelevant information. Processing capacity was the amount (number) of stimuli that an individual can absorb. A limited capacity suggests that the individual cannot do two mental operations without them interfering with each other. Alertness was studied by varying the time between a warning signal and a pair of letters which the subject was asked to match. Selectivity was studied by providing one of the two letters so that the time to the second letter provided a function related to encoding of the first letter-matching task. It was also found that both processes could operate

simultaneously without interference because they didn't involve processing capacity. Processing capacity was studied by a letter task. The subjects were told to press their right index finger if the letter that appeared had the same letter name. For example; A or a. They pressed their right middle finger if the names were different. They were to press their left index finger if they heard the white noise burst in their ear. It was found that processing capacity was limited when it involved encoding information.

2.3 THEORIES OF ATTENTION

The earliest theory of attention was the selective filter model. This model is pictorially a "Y" tube-like shape which received stimuli in the two branches at the top and processed the information after the juncture. When stimuli entered simultaneously through both channels, the information became jammed in the junction. Processing, as a result, did not occur. When one stimulus preceded another stimulus the first stimulus was attended to and the latter was blocked out completely (Broadbent, 1957).

Broadbent (1958) described selective attention as a filter which chose stimuli on the basis of biased characteristics and excluded others. In other words, stimuli that one is able to relate to will be processed and other stimuli will be excluded. Another idea on selective attention was proposed, suggesting that when more than one stimuli was

presented, the importance and general arousal that the information elicits would be the determining factor in selection (Deutsch & Deutsch, 1963).

This was supported by studies presented by Egeth (1967) where the author fed different information into both ears of a subject simultaneously. The subject was asked to block out the message received in one ear and focus his attention on information in the other ear. Initially, the subject was unable to report what was said in the ear which was to be ignored. When the experiment was repeated with the subjects name occasionally being repeated in the ear he was to ignore, the subject's attention was altered. Thus, the subject was able to repeat parts of the message that was presented following his name.

This demonstrated that information was not completely blocked out, contradicting Broadbent (1957) and suggesting that if the information is important enough it would be selected. It also demonstrated that more than one stimuli can be attended to at one time (Murray, 1974). Another aspect of attention is the role of attention in a central and peripheral task. It was found that when doing two unrelated tasks at the same time, the ability to perform the peripheral task was decreased (Webster & Haslerud, 1964).

A more detailed theory was proposed on the topic of selective attention (Norman, 1968). It involved the interpre-

tation of the stimulus through matching it with what was already in storage (memory). Based on this storage source, a selection of the pertinent stimuli was made. The interpretation process initially involved the transformation of the signal into a physiological form. Various operations extracted special features of the signal and found the location in storage of the matched information (stored representation). Based on this information or stored representation, the importance and relevance of the stimuli was assessed. This assessment was done through the activation level that was elicited. The stimuli that elicited the greatest activation was selected for further processing. Modes of activation are of two types: a temporary excitation (short-term storage) and a permanent excitation (long-term storage).

Another theory of attention to be presented is the feature-integration theory (Treisman & Gelade, 1980). It was suggested that one becomes aware of unitary objects in two different ways. Firstly, through focal attention. This suggests that features come first in perception, automatically and parallel across the visual field. For example, stimuli are initially coded along a number of separate dimensions such as: color, orientation, spatial frequency, brightness and direction of movement. Objects are identified later in the process. The synthesis, of these separate representations, is through the serial processing with focal

attention. Once they are correctly registered, the compound objects are stored as such for future perception. The authors stated that without focused attention, features would not be related to each other. When memory decay occurs or interference resulted the features would disintegrate and "float free" or combine to form "illusory conjunctions." The "illusory conjunctions" are the incorrect combining of features that occur when more than one unattended object is presented. This theory suggested that one cannot consciously "perceive" an unattached shape without also giving it a color, size, brightness or location. However, unattended areas are not perceived as empty space. In order to clarify this point, a second awareness of unitary objects was called top-down processing. The unfocused attention or exposure to overloading resulted in features which could be formed randomly yielding 'illusory conjunctions.' However, in the highly familiar environment in which one operates, searching for the right conjunctors was almost error-free. Only if the task is unfamiliar or less predictable was efficiency decreased. This theory helps one to understand the relationship between familiar and novel stimuli.

The theory of attention used in this study was outlined by Nideffer (1979a). Nideffer has identified two dimensions of attention. Firstly, the width dimension which can be narrow or broad. Secondly, the direction dimension which can be external or internal. Attentional processes have

both state and trait components associated with each of the attentional abilities (broad-external; broad-internal; narrow-external and narrow-internal. See Appendix A, Figure 1).

The ability to develop all four areas takes time and experience. Individuals who are dominated by one of these attentional styles will make attentional errors if it's dominance is inappropriately focused. For example, the individual who is dominated by the broad-internal focus of attention tends to overanalyze and out-think himself. Instead of attending to the task, he is trying to decide what to do next or what should have been done on the last play. This was called "analysis to the point of paralysis" (Nideffer, 1981; Botterill & Winston, 1984).

The goal for the athlete is to become mentally flexible. This means to have the ability to switch the focus of attention from one of the four types of attentional styles to another. Thus, using this flexibility as the sport's situation demands (Nideffer, 1979a; Orlick, 1980).

To be dominated by one attentional style (see Appendix A) can turn a strength into a weakness. This is because of the failure to shift to a more appropriate type of concentration as is demanded by the situation. This inflexibility often results when under pressure (Nideffer, 1979b).

Even the best athletes have some attentional weaknesses. For example, Reggie Jackson was in the second game of the world series and the last man at bat. The count was three and two with two out. Therefore, the runners on base were going to be running on the delivery of the pitch. Jackson's narrow-external focus of attention was broken because he forgot that the runners would be moving. As a result he thought about the runners, thus his attention was focused inwardly for a second and by that time, the ball was by him for the final out (Nideffer, 1979b).

All sports and sport situations require specific attentional styles. For example, tower diving requires a high degree of concentration with attention focused externally and very narrowly (Nideffer, 1971 & 1983a). This same attentional style is necessary in executing a free-throw in basketball. This year a basketball player on the Bison Women's Basketball Team went to the free-throw line in a critical game and was noticeably distracted by the coach of the other team. As a result, one might hypothesize that she could not regain the narrow external attention required to stay on task. Instead, she focused internally attending to negative thoughts about the rudeness of the opposing coach, thus, such irrelevant information proved to be distracting and she missed the shot.

It is sometimes hard to ignore distracting voices or cues but this can be worked on with practice. For example, a

tennis player who was distracted by line calls in competition may work on a strategy to help refocus her attention. It might be a simple self-statement stating that bad calls are all a part of the game. This will enable the athlete to focus back on the task (Weinberg, 1984).

There is a need for a coach in a sports situation to be able to predict performance in order to decide on the next substitution. It is valuable information to know who is most likely to "choke" (high NAR & RED subscale scores) and who has the mental toughness to handle the pressure (high BET, BIT & NAR; low OET, OIT & RED subscale scores) (Nideffer, 1979b). A coach must be able to anticipate the effects of a half-time talk. The coach must know when it is time to get angry at the athletes and when to stay calm and help them to focus their attention on relevant information. An athlete that is confident can be challenged and one who lacks confidence may need to be redirected (Nideffer, 1980b; Buceta, 1985).

2.4 THE EFFECTS OF ANXIETY ON ATTENTION

It has been accepted that as anxiety increases, the focus of attention narrows and as a result performance decreases in complex tasks (Easterbrook, 1959; Agnew & Agnew, 1963; Wachtel, 1967 & 68).

Attention was divided into two attentional processes, span and scanning by McNamara & Fisch (1964). The span of attention is concerned with the total number of stimulus elements and/or the gross amount of stimulus information perceived in that span which are relevant to a task. Scanning requires "the discrimination of small nuances in and between cue elements where no previous experience has occurred with the specific elements, and is concerned with acquisition and acceptance or rejection of specific cue elements relevant to a task" (McNamara & Fisch, 1964, p. 572). Therefore, the person knows what specifically to focus on and ignores irrelevant stimuli. These processes were tested under three treatment conditions. The first was high motivation, through a nonrelevant means, by the threat of electric shock. The second condition was high motivation through a relevant means by money reinforcement. Relevant motivation was interpretated to mean that it was relevant to the task. The more the subject did the more the subject was reinforced by money. The electric shock was a nonrelevant motivator because it was not relevant to the task. The subjects were told that they could not avoid the shock even if they performed well on the task. The third condition was a low motivation group. McNamara & Fisch (1964) found that the span mechanism was adversely affected by highly relevant and highly nonrelevant motivation. In terms of the scanning mechanism, the high nonrelevant motivation (threat of shock) was not disruptive in general and high relevant motivation

(money reinforcement) resulted in significantly better test scores.

Weltman & Egstrom (1966) conducted a study in the sport of underwater diving. The task was for the diver to react to a light located 60 degrees into the periphery on the left side of his mask. The diver was to turn out the light by an underwater switch he carried as soon as he could see it. This was done while doing a dial monitoring task (passive) or an addition task (active) located centrally in his focus of attention. The researchers also had a group of subjects doing the peripheral light task alone. These tasks were done in three settings, on the surface, in a tank and in the ocean. The ocean setting was considered the situation which would induce some stress to the sport. It was found that the simultaneous performance of the central and peripheral task did not affect significantly the response time needed to switch off the peripheral light. This also occured on the surface and response time remained the same over all experimental runs. The authors suggested that this demonstrated that the central task was not demanding enough to distract one from the peripheral task. However, for some subjects the response times were longer in the ocean than in the tank. This partially supported the idea that under stress perceptual narrowing occured. However, not all subjects reacted this way because diving in the ocean was not stressful for all the subjects.

Wachtel suggested that more research was needed to assess the kind of narrowing that occured under stress, as well as identify the type of individuals that were likely to be stressed more easily than others. To provide this information a tracking task was used by Wachtel (1968) with time on target as the dependent variable. There were four groups with the first being a control group. Group two was told that the subjects would receive an electric shock while doing a task over which they had no control. The third group was told that they would receive an electric shock if their scores were below a certain point. Thus, the subjects had control over the shock occurring. The fourth group was told that if they were doing poorly, a light would come on to indicate this. Subjects were to turn off this light as soon as it came on. The scoring in all groups was the time on target minus the time the light was on. Therefore, all groups had to divert their attention to turn off the light but only the fourth group had a purpose attached to the light coming on.

It was found that groups one (the control group) and four (no threat of electric shock) performed no differently than groups two and three who both had the threat of shock. This finding was in terms of performance on the central task. However the peripheral task yielded longer reaction times for groups two and three relative to one and four.

It was also found that groups two which could not control the electric shock had poorer performance in terms of reaction time to turn the peripheral light off than group three who had control over the electric shock. Both groups performed similarly on the centrally located task.

This study enhanced information pertaining to what occurs to the focus of attention, under an anxious situation, when the anxiety can be controlled. The next question that needed to be answered was: what happens to attention when anxiety is increased and the peripheral cues provide relevant as opposed to irrelevant information?

To examine this question, subjects were told to focus straight ahead at two lights (Cornsweet, 1969). In the periphery there were lights on either side of the subject. Following an auditory cue, one of the lights in front of the subject went on. The subject would release one of two buttons which he was continually depressing to indicate whether the right or left light went on. Without the subjects knowledge, whenever the right light went on in front of him, the right periperal light came on as a warning light. If the subject figured out this strategy and therefore was paying attention to his periphery, the reaction time would be cut down noticeably.

It was found that when using relevant peripheral cues, under an anxious situation (threat of electric shock) the

subjects did not narrow their focus of attention. Subjects used these peripheral cues to aid in their performance to a higher degree than the nonaroused subjects.

Cornsweet (1969) stated that previous studies had not tested the subjects under conditions where the peripheral information was relevant to the task. This is a misconception because Wachtel (1968) as described above, used relevant peripheral information. The lights going on in the periphery had to be turned off by the subject as quickly as possible. This time, was subtracted from the time on target, of the central task. Therefore, the information in the periphery was important or relevant to the total performance of the task. If this is true, then the results are conflicting. Wachtel's subject's attention narrowed as anxiety increased and Cornsweet's subject did not. Perhaps Cornsweet's task required a degree of narrowing in order to concentrate better on the white lights. Wachtel's study had orange lights in the periphery which would require less concentration. As anxiety increased a narrowing occurred and this lack of concentration on the periphery affected performance.

The above idea has also been supported by Hockey (1970) and Bacon (1974). Specifically, some stimuli are paid attention to more than others under normal circumstances. As anxiety increased the subject focused more intently on the stimuli he had previously focused on and ignored the extra-

neous stimuli. Thus, there was an increase in attentional selectivity as anxiety was increased and sensitivity was systematically lost to stimuli which was not initially focused on.

Another reason for the conflicting results might be that Cornsweet was using a single task in which attention did not have to be divided. Wachtel, on the other hand, relied on divided attention in order for his subjects to perform (Lander, 1982).

Anxiety can have adverse effects on written tests as well. This has been explained by the fact that low test-anxious people are able to keep their thoughts on the task at hand and thus perform well. High test-anxious people focus their attention inwardly on self-evaluation, worrying about their responses and concerned about failing and as a result don't perform as well (Wine, 1971).

Walker, Nideffer & Boomer (1977) found in the sport of tower diving that as anxiety increased and the dive became more complex, performance was inhibited. Other support for this was seen in a study by Kauss (1978). After administering a questionaire based on an athlete's readiness for competition, the author found that "starters" were perceived to perform better when calm, while less utilized players are better when worked up. This can also be related to the complexity of the task. A "starter" probably performs more

complex tasks than the "non-starter" because the former's skill level is higher than the latter. A complex dive would tend to take more concentration than a more basic dive. If anxiety was increased concentration would be broken and the diver would focus internally. As a result, the diver would inwardly focus on thoughts such as described above on the written tests.

Studies have been conducted on hostile-aggressive athletes and generally anxious athletes. In both cases their state of mental health inhibited their performance. Hostile-aggressive athletes were distracted by their emotions instead of focusing their attention on the task at hand (Silva, 1979). Coleman (1980) studied athletes in the shooting sports and found that those who are generally in a high anxious state tend to lack the concentration necessary to be world class shooters.

This was also found when testing open and closed skill shooters. High anxiety athletes tended to be at least a full standard deviation higher on the overload and reduced attentional focus scales of Nideffer's TAIS. It was found that low anxious shooters were generally better shooters and were better at maintaining focus on task relevant cues. These subjects also were better able to reduce their sensitivity to task-irrelevant environmental stimuli (Landers, 1978 & 1982).

When considering all the effects that arousal has on performance, it is important for the coach to know the perceptual demands of the sport. Attentional focus can be broadened or narrowed by changes in arousal level of the athlete. The coach then can stimulate this change as the demands of the sport require (Landers, 1978).

The presence of an audience can motivate the athlete and thus increase performance. However, if the audience increased the arousal of the athlete to a point that does not match the demands of the sport then performance is inhibited (Landers & McCullagh, 1976).

A quarterback who missed the open man because he narrowed his focus of attention has to relax on the sidelines in order to broaden his focus. The effect of a coach yelling at the quarterback would increase his arousal further and therefore would not be giving the athlete what he needed. A better approach would be for the coach to help the quarterback focus on the next set of strategies needed when he goes into the game again. This would keep his anxiety level down and thus help him to re-focus his attention (Nideffer, 1978).

There are three things that happen to attention when anxiety is increased. First, the flexibility of the individual to go from one focus of attention to another is reduced. Second, the attentional focus begins to narrow involuntari-

ly. Thirdly, the attention becomes internally focused (Nideffer, 1980b). Identifying an athletes attentional strengths and weaknesses will aid the coach in determining which athletes are most likely to be effected by an anxious situation to the detriment of their performance. For example, an athlete with a high NAR subscale score and low BET subscale score will become attentionally reduced sooner than someone with a high BET subscale score (Nideffer, 1980a).

This last paragraph outlined a more specific effect of anxiety on attention. It also described how attention changes as anxiety increases from a moderate level to a very extreme level. It is important to remember that anxiety only occurs when the individual perceives a situation as threatening. As athletes go through different situations, their experience reduces the number of situations that they see as threatening.

2.5 NIDEFFER'S TEST OF ATTENTIONAL AND INTERPERSONAL STYLE

Nideffer (1983b) has stated that individuals in psychology, have recognized that a person's ability to control attention; to direct it to task relevant cues and to avoiding irrelevant cues are critical determinants of behavior. It can explain the difference between an excellent performance and a poor performance. In order to understand, control and predict behavior, one must be able to measure a combination of attentional style (traits) personality characteristics

and interpersonal situations or factors and determine how they affect performance.

In response to the need for an instrument which could measure attention, Nideffer designed the TAIS. It is a pencil and paper self-report inventory containing 144 questions which takes about twenty-five minutes to complete. There are seventeen subscales of which six are attentional, two are control and nine are interpersonal. The six attentional subscales are important in the sport settings in hope of understanding, controlling and predicting athletic behavior. (see Appendix A). A shorter version of the TAIS is found in Appendix C. This version includes the fifty-nine questions that were later revised for the B-Ball TAIS. The rationale and test construction was extracted from Jackson (1971) and was presented earlier in this paper (Nideffer, 1981). Nideffer (1983) formulated behaviorally relevant items (questions) that were felt to tap the various skills and abilities important in day to day living. Items that represent eighteen subscales were administered to college students. An item analysis was performed on the test. Specifically, each item was correlated with the various subscales on the test. From this, the higher correlated subscales were retained, yielding seventeen conceptually independent subscales.

It was assumed that the attentional characteristics being measured by the TAIS reflect performance related ability.

Concurrent validity is shown by the correlations between performance on the attentional scores of the TAIS and a coach's performance ratings of male swimmers on an eleven-item scale. The results demonstrated that the swimmers who scored high on the three scales; overloaded external, overloaded internal and reduced attentional focus were rated by the coach's as inconsistent performers. Correlations were .60, .67 and .63 for the three subscales respectively. Swimmers scoring high on the TAIS scale measuring the tendency to make errors of underinclusion (narrowing their focus) were rated by the coach as choking under pressure, falling apart if they make early performance errors, having to work hard for everything they obtain and as becoming worried about one particular thing and dwelling on it. These correlations were .75, .59, .66 and .80 respectively (Nideffer, 1976).

The test-retest reliability for the TAIS is .83 with a mean two-week period between testing. There was a significant difference between males and females on five of the seventeen TAIS subscales, therefore providing support for controlling for sex as a variable in research utilizing this inventory. Specifically, for the attentional subscales, the males scored higher on BIT & NAR subscales. Males also scored higher on three of the interpersonal style subscales; P/O (more physically oriented) IEX (more intellectually expressive) and PAE (less expressive of positive affect). The

differences were explained on the basis of social learning discrepancies. Namely, men are described as more physically oriented, more openly competitive, and less expressive of positive affect than females. Also, males need to be in control and their competitiveness causes men to make more use of the narrowed and broad-internal attentional processes.

Construct validity was examined by correlating TAIS subscales with the same individuals scores on other psychological instruments. For example; MMPI, California F Scale, Rotter Internal-External (I-E) Scale, and others. It was found that the correlations between the TAIS and other tests provided some construct validity. For example, TAIS self-esteem correlates .69 with POI self-regard, TAIS introversion with neuroticism on the MPI (.36) and with spontaneity on the POI (-.61). Construct validity was shown by correlations with other tests in the following attentional subscales: becoming overloaded with internal stimuli, making errors of underinclusion and having an effective broad internal focus (Nideffer, 1976).

The TAIS scores were translated into T-scores and put on standard score sheets to indicate the individual's profiles (Nideffer, 1980a). The standardized scores were devised from administering the TAIS to college students. The mean and median of the profile, in this case are the same, namely 50.

The percentile scores are useful if the individual wants to compare himself to the average person, however, it was suggested that the best comparison is with yourself (Pratt & Nideffer, 1981). The goal is self assessment. The individual can become aware of their strengths and weaknesses and is encouraged to act on improving on weaknesses through various training techniques. For example, progressive muscular relaxation, mental rehearsal and attention-control training (National Coaching Certification Council, 1981; Nideffer & Sharpe, 1978; Owen & Lanning, 1982). A description of these and other methods of improving attentional control are beyond the scope of this review.

This section of the review has demonstrated the validity and reliability of the TAIS and emphasized some uses for administering the test. The final portion of this review gives further support for the validity of the TAIS as well as some speculation as to whether the subscales are indeed measuring what they are supposed to measure.

2.6 SUPPORT AND CRITICISMS PRESENTED ON THE TAIS

A study by DePalma & Nideffer (1977) involved assessing the ability of the TAIS to identify and discriminate between existing subgroups of psychiatric patients and normal subjects. The results were favourable in terms of being able to identify the psychiatric patients through the interpretation of their profiles. The test was able to distinguish

the patients between the existing subcategories. For example, separating the premorbid schizophrenics from the psychotics and neurotics.

Turner and Gilliland (1977) questioned the validity of the six attentional scales of the TAIS. The subjects used in this study were ten male and forty-six female introductory social science students who participated as a part of a course requirement. The subjects were tested using a Block Design test which requires subjects to simultaneously attend to a color and pattern. Subjects who perform well on this test are able to attend to small portions of the figure at a time. The digit span test measures the ability to focus attention and concentrate. The researchers found that when using the above mentioned tests, only one of the twenty-four correlations calculated were statistically significant. Turner and Gilliland (1977) concluded that the construct validity of Nideffer's TAIS requires further study.

Nideffer (1977) analyzed the raw data and added different types of subjects to the data in order to get a normal population. This resulted in reporting significant correlations. Turner and Gilliland (1977) failed to consider that the Block Design test is only a good test if used with a normal population. The researcher had used a bright college population which skewed the scores.

In a study by Vallerand (1983) the TAIS was administered to male basketball players. The players were from a university team; four "AA" Cegept teams and one "AAA" Cegept team. They were divided into poor, average and good decision making groups. The task was a three on two and two on one drill. It was found that there was no significant difference between the profiles of the three groups. This led to the conclusion that the TAIS must become more situation specific.

Van Schoyck and Grasha (1981) devised a Tennis-TAIS in which they modified the questions pertaining to the attentional subscales of Nideffer's TAIS. For example, a question on Nideffer's TAIS in monitoring the overload external subscale would be:

> "At stores, I am faced with so many choices I can't make up my mind" (p. 152).

The Tennis-TAIS (T-TAIS) would read:

> "When making a shot, I'm faced with so many alternative placements that I can't make up my mind" (p. 153).

This test was administered to forty-five men and forty-five women tennis players from two clubs and one public tennis location which were of varying skill level. Van Schoyck and Grasha found that the T-TAIS had higher test-retest reliability coefficients and internal consistency alphas (Cronbach Alphas) than Niddefer's TAIS. Correlations and

factor analysis supported Nideffer's width dimension, but the direction dimension was absent. These researchers found that sixty percent of the variance was contributed to the first factor. The subscales that composed this first factor was BET and BIT. This supported Nideffer's width dimension and was considered the "scanning" factor. The second factor accounted for nineteen percent of the variance and was composed of subscales OET, OIT and NAR (see Appendix A). The authors considered this the "focusing" factor and also supported Nideffer's width dimension. It was concluded that the sport specific TAIS was a better instrument for assessing tennis players than the general TAIS developed by Nideffer.

There has been some thought that attention must be investigated in terms of alertness, selectivity and processing capacity as described earlier in this review (Posner & Boies, 1971). As a result, Etzel (1979) developed a rifle-shooting questionnaire representing five subscales. They were, capacity, duration, intensivity, flexibility and selectivity. Attentional capacity was defined as the amount of mental effort used to attend to shooting-related stimuli at any moment. Attentional duration was defined as the amount of time spent on attending to specific task-related stimuli. Attentional intensivity was defined as the degree of alert conscious sensitivity to task-related stimuli at a certain point in time. Attentional flexibility is the abil-

ity of an individual to direct and alter the scope and focus of attention. This definition is in accordance with Nideffer's definition (1976). Attentional selectivity is the process of discriminantly perceiving relevant task-related stimuli and the ability to screen out irrelevant task-related stimuli. Etzel (1979) found through factor analysis all the factors were relevant except duration. Thus, Nideffer's two-dimensional model of attention has been discarded by Etzel and expanded to four relatively independent components. It is possible that these factors only emerged because of the specificity of the sport.

When examining a study (Miller, Blackler & Edwards, 1983) done in the sport of field-hockey, it was found that attentional capacity was described separately from attentional style. Attentional style was described under the two dimensional idea as stated by Nideffer. Attentional capacity, on the other hand, was described as the ability to recognize a situation, decide the plan of action and execute the response. The purpose of the study was to test whether a better player was able to process the information more efficiently and therefore take in more information. Another thought was that the better athletes take in the same amount of information but are able to process it in less time. Two groups of athletes performed a control dribbling task. One group was from the first team and the other group was from the seventh team in terms of league ranking. There was no

difference in their ability to control the ball. Subjects repeated the test but this time had to simultaneously call out the color of the illuminated light as they went along the course. It was found that the more skilled players from team one did better at the task and made less discrimination errors than the players from team two. This supported the idea that better players are more efficient at processing more information then poorer players (Miller, Blackler & Edwards, 1983). Again this subclass of attention was called attentional capacity which was tested separately from attentional style. Thus, indicating support for Nideffer's two dimensions of attentional style and partial support for Etzel's sport specific hypothesis.

A portion of attentional capacity was examined by Allard, Graham & Paarsalu (1980). A group of basketball players were compared with nonplayers on a recall task of basketball games. One half of the slides included unstructured situations like turnovers or a defensive rebound. The other half represented structured play, such as an offensive pattern or a type of pressing defense. It was found that the basketball players were better at recognizing only the structured slides.

The second part of the study was to view some of the same slides again while adding new slides. It was found that the basketball players were able to recognize the nonstructured and structured slides better than the nonplayers. The au-

thors' concluded that this indicated that the basketball players had a deeper perceptual encoding mechanism than the nonplayers. This finding relates to the situation recognition part of attentional capacity discussed in the above mentioned field hockey study (Miller, Blackler & Edwards (1983).

It was found that volleyball players also were more advanced in their ability to perceive volleyball situations. When presented with structured and unstructured situations on slides, the players were superior to nonplayers in detecting whether the volleyball was present or absent in the slide. Allard and Starkes (1980a) described this advanced perceptual ability as a rapid visual search targeted on the ball.

The TAIS has been administered to golf players. The results indicated that the better golfers were overloaded by external stimuli, had a broad internal focus, tended to have a reduced attentional focus and tended to worry about specific things a great deal. It is clear that the golfers would be poor golfers if they actually had the above attentional problems while golfing. These findings were taken lightly because the TAIS measures attention in daily life and better insight on attentional style would occur in a sport specific TAIS (Kirschenbaum & Bale, 1980). Again, supporting the need for a more sport specific TAIS.

Further criticisms of N-TAIS is apparent when analyzing Nideffer's data on concurrent validity. The correlation coefficients reported by Nideffer (1976) that were found to support concurrent validity were .75 for choking under pressure, and .59 for falling apart if they make early performance errors. Athletes who had to work hard for everything they obtain had a correlation coefficient of .66. While the athlete that was becoming worried about one particular thing and dwelling on it had a correlation coefficient of .80. These coefficients are not high enough to make important decisions about an individual. Van Schoyck & Grasha (1981) found that Nideffer's TAIS had an overall internal consistency alpha of .63. In fact, all the subscales were reported as being below .78. It has been suggested that an internal consitency measure above .80 is necessary. If a subscale cannot satisfy this criterion, then, the researcher should try to determine the reason for this occurence (Crano, W. D. & Brewer, M. B., 1973). The Tennis TAIS was found to have an internal consistency alpha of .72 overall and only two subscales fell below .80. Both tests have subscale alpha's below the criterion set by the above authors. The higher alpha's found in the T-TAIS lead to the conclusion that it was a better instrument than Nideffer's TAIS and thus another reason for the importance of a sport specific TAIS.

2.7 SUMMARY

Attention contains broad (scanning) and narrow (focus) components. Attention can be focused externally or internally. It can be divided into alertness, selectivity and processing capacity. Individuals become aware of stimuli through focal attention and top-down processing. The effects of anxiety on attention includes the decrease in mental flexibility, the narrowing of attention and the involuntary narrowing of attention inwardly.

The Test of Attentional and Interpersonal Style was developed as a paper and pencil self-report inventory. It is composed of seventeen subscales of which the six attentional subscales are relevant to the athletic situation. There has been criticism of this test in terms of its generality. Therefore, others have tried to design a more sports specific test of attentional style. There is evidence that a more sport specific test is a better test and therefore the direction for future research.

Chapter III

METHODS AND PROCEDURES

3.1 SUBJECTS

Ninety female basketball players served as subjects in this study. The subjects were divided into three equal groups based on caliber. Group one consisted of thirty players representative of the University level. They were considered the "elite" group. Groups two and three consisted of players from grades nine through twelve. The former, consisted of the better players from a high school basketball team. They were considered the "superior" group. The latter, consisted of the weaker players from highschool basketball teams. They were considered the "average" players.

3.2 PROCEDURE

Junior highschool and highschool basketball teams were randomly selected using a random number table. The coaches of these teams were contacted and some background information was discussed with them as to the purpose of the test and what was involved. This method was repeated until the full compliment of subjects volunteered.

3.3 TEST CONSTRUCTION

Fifty-nine questions were directed at the attentional style subscales and the information processing control subscale which was adapted from N-TAIS. The attentional style subscales were reworded to a related basketball situation. This was done with the aid of the T-TAIS sample questions (Van Schoyck & Grasha, 1981). For example, N-TAIS question:

> "I am good at rapidly scanning crowds and picking out a particular person or face" (p. 152).

The T-TAIS changes this question to:

> "I am good at quickly analyzing a tennis opponent and assessing strengths and weaknesses" (p. 153).

The B-ball TAIS will read:

> "I am good at quickly analyzing opposing basketball players and assessing strengths and weaknesses."

A great deal of work has been done to validate N-TAIS, therefore the same sentence construction was maintained, in order to alter the test as little as possible. The complete B-Ball TAIS is found in Appendix B. These parallel the sample questions of N-TAIS found in Appendix A.

A pilot study was completed to determine whether subjects had any difficulty with questions on the B-Ball TAIS, and to facilitate a preliminary statistical analysis of the instrument. It was found that the NAR and BET subscale scores had

low reliability coefficients. Questions representing these subscales were given further examination and it was noticed that questions 4, 6, 20, 42, 44 and 55 lacked clarity and had the potential to be mis-interpreted. Questions 8, 33 and 34 were considered to be not measuring the proposed subscale. Therefore, these questions from the B-Ball TAIS used in the pilot study were revised (see Appendix B).

It was found that the predictive validity of both tests was not significant. However, the B-Ball TAIS demonstrated higher overall correlation coefficients than N-TAIS. The construct validity did not show a significant difference between the two groups for either tests. However, it was found that with the B-Ball TAIS, the higher caliber group had better scores among all the subscales than the lower caliber groups. N-TAIS demonstrated better scores for the poor caliber group. This indicates that the B-Ball TAIS has the potential to distinguish between athletes of different caliber. This also yields support for a sport specific measure of attentional style.

3.4 TEST ADMINISTRATION

The subjects were given a brief written introduction as to the purpose of the study and some background information (see Appendix D). N-TAIS questions were administered in their entirety. However, only the scores for the questions representing the six attentional subscales and the informa-

tion processing control subscales were used for purposes of this study. The reason for this was that only these particular subscales were pertinent to the statistical procedures later described.

Half of the subjects in each group did the TAIS first and the other half did the B-Ball TAIS first. This was achieved by altering the order of the tests given to each player. This was to ensure that the order of doing the test was not a factor. The subjects that requested a copy of their scores on the TAIS and B-Ball TAIS with interpretations, provided their name and address on the back of the B-Ball TAIS. To ensure that all three groups of subjects received the same introductory information before doing the tests, an information sheet (see Appendix D) preceded the TAIS.

3.5 RELIABILITY

In order to assess reliability of the B-Ball TAIS, the test-retest technique was used. Thirty re-tests were distributed to the "elite" group and twenty-two of them were returned. The interval between the tests was two to three weeks. Each subscale for each of these subjects were compared on the original test to the re-test score. One reliability coefficient was drawn from the data set for each subscale. A significant reliability coefficient was set at the .05 level. In order to assess internal consistency for the entire test, Cronbach alphas were measured.

3.6 CONSTRUCT VALIDITY

In order to account for the total variation, in terms of proportions among the subscales in the B-Ball TAIS, a Principle Component Analysis was performed. This procedure also presented the correlations between the subscales for the TAIS and B-Ball TAIS.

Further evidence of validity was assessed through the relationship of the B-Ball TAIS and TAIS scores to basketball skill level. The difference between the three groups of scores for each scale was assessed by the Wilcoxon-Rank sum test at the .05 alpha level.

3.7 PREDICTIVE VALIDITY

The ability of the Basketball-TAIS to predict differences within a group of top University basketball players would provide additional evidence of validity. Specifically, the top University players were ranked by their coaches. The combining of the rankings was assisted by the Women's Junior Provincial Assistant Coach. The grade nine to twelve high-school players were ranked by their coaches and the combining of the rankings was assisted by the Women's Juvenile Head Basketball coach. The rank-order correlations for these players was calculated for the B-Ball TAIS and the TAIS using the Spearman Rho at the .05 level. The rank-correlation was computed between an individual's ranking and the score on each subscale.

Chapter IV

RESULTS AND DISCUSSION

4.1 RELIABILITY OF THE B-BALL TAIS

The sport-specific B-Ball TAIS was expected to be a better instrument for measuring attentional style in basketball players than N-TAIS. As presented in Table 1, it was found that N-TAIS had all of the subscales with significant reliability coefficients. The B-Ball TAIS had six out of seven significant reliability coefficients. Both tests had almost the same overall reliability coefficient, .75 for the B-Ball TAIS and .747 for N-TAIS. These coefficients are lower than the .83 which was reported by Nideffer (1976). Van Schoyck & Grasha (1981) found a test re-test correlation of .71 for N-TAIS and .83 for the Tennis TAIS. The discrepancy between these findings may be due to the different populations that were tested (including numbers) or the differing interval between the test and re-test. Van Schoyck & Grasha (1981) did the test re-test with forty-one subjects for N-TAIS and forty-two subjects for the T-TAIS. There was an interval of ten to one hundred and one days between the tests, with a mean of thirty-two days. Nideffer (1976) had an interval of two weeks for his study with introductory psychology students (45 males and 45 females).

Table 1

Reliability Coefficients for both Tests (N=22)

Subscale	B-Ball TAIS Coefficient	N-TAIS Coefficient
BET	.90 (.0001) *	.59 (.0033) *
BIT	.57 (.0052) *	.81 (.00001) *
OET	.88 (.0001) *	.79 (.0001) *
OIT	.83 (.0001) *	.86 (.0001) *
NAR	.90 (.0001) *	.82 (.0001) *
RED	.40 (.0647)	.51 (.0142) *
INFP	.78 (.0001) *	.75 (.0001) *
MEAN	.75	.747

*=significant correlations at the .05 alpha level

() denotes the P-Value

Table 2

Internal Consistancy (Cronbach Alpha) (N=30)

B-Ball TAIS Alphas		N-TAIS Alphas	
Subscale	Alphas	Subscale	Alphas
BET	.6365	BET	.6644
BIT	.7355	BIT	.6732
OET	.8086	OET	.7003
OIT	.7233	OIT	.7696
NAR	.5675	NAR	.4807
RED	.5722	RED	.6276
INFP	.7088	INFP	.7506
MEAN	.6899	MEAN	.6666

As presented in Table 2, it was found that the internal consistency (Cronbach) alpha's averaged out to a higher reliability coefficient than N-TAIS. The B-Ball TAIS had higher BIT, OET and NAR subscale alpha's than N-TAIS. N-TAIS had higher alpha's than the B-Ball TAIS for BET, OIT, RED and INFP.

The B-Ball TAIS had a higher overall internal consistency alpha, although the difference between the two tests was very small. Both tests demonstrated what would be considered good reliability scores for the purposes of this study. The standard error of measurement ranged from .937 to 3.4 for the B-Ball TAIS and 1.28 to 2.21 for N-TAIS. The fluctuations in the consistency that do exist may be due to: 1) the mis-reading of a question, 2) the varying degree to which the question measures that subscale construct, 3) the ability of the subject to relate to the question and 4) the truthfulness of the subject. It was also found through written feedback, from highschool subjects, that only three of sixty subjects had problems with some of the questions. Therefore, it must be concluded that the subjects had adequate understanding of the questions.

4.2 CONSTRUCT VALIDITY OF THE B-BALL TAIS

The Principle Component analysis as found in Table 3, also included the inter-correlations among the subscales, as found in Table 4. The subscale pairs BET-BIT and OET-OIT had high positive correlations. This finding was supported by the Tennis TAIS (Van Schoyck & Grasha, 1981). Van Schoyck & Grasha stated that this was indicative of the common factor among the subscales. Namely, the "broad" focus of attention for BET-BIT and the "overload" of scales OET-OIT. A high positive correlation was also found between BET, BIT and INFP. This reinforces the "broad" dimension again but not the direction dimension. The inter-correlation between subscales BET-OET and BIT-OIT were -.54 and -.47, respectively. In other words, moderately negative thus, partially supporting the idea that they are polar opposites (Nideffer, 1976). Therefore it is questionable whether the breadth dimension is indeed bipolar. Perhaps, as suggested by Van Schoyck and Grasha (1981) it is a multidimensional concept. There must be other dimensions involved which is causing the moderate correlation as presented by Posner & Boies (1971), Miller, Blackler & Edwards (1983) or Wachtel (1967).

The Principle Component analysis indicated that 60% of the variance was found in the first principle. Subscales; BET, BIT, NAR and INFP are all positively correlated while the OET, OIT and RED subscales are negatively correlated. This was expected as high scores in the former set of

Table 3

Eigenvectors from the Principle Component Analysis of the B-Ball TAIS

	PRIN1	PRIN2	PRIN3	PRIN4	PRIN5	PRIN6	PRIN7
BET	.39	.35	-.08	-.65	-.25	.39	.28
BIT	.41	.30	-.25	.38	-.26	.20	-.65
OET	-.39	.36	-.23	.46	-.43	.15	.49
OIT	-.37	.47	-.25	-.10	.68	.28	-.16
NAR	.37	.15	.63	.42	.32	.31	.28
RED	-.30	.51	.60	-.19	-.26	-.31	-.29
INFP	.40	.38	-.25	.07	.22	-.72	.26

Table 4

Basketball TAIS Intercorrelations among the Subscales

	BET	BIT	OET	OIT	NAR	RED	INFP
BET	-						
BIT	.73	-					
OET	-.54	-.47	-				
OIT	-.41	-.47	.74	-			
NAR	.54	.59	-.59	-.54	-		
RED	-.31	-.46	.57	.56	-.18	-	
INFP	.74	.80	-.48	-.37	.55	-.39	-

subscales are good scores and low scores in the latter are good scores. A good basketball player is hypothesized to be characterized by having high scores in the BET, BIT, NAR and INFP subscales. This player would also have low scores on the OET, OIT and RED subscales.

The first principle is principally composed of subscales BET, BIT, OET and INFP. The second principle is principally composed of subscales RED and OIT. The second principle accounts for 16% of the variance, for a total of 76% for the first two principles. The eigenvalues for the first two principles are 4.18 and 1.09, respectively. The third principle has an eigenvalue of .75 and is principally composed of the NAR and RED subscales. The last four principle components have eigenvalues that are less than .50 and therefore are not included as important components.

The results of this study fails to support Van Schoyck & Grasha's findings with the Tennis-TAIS. The T-TAIS study found (1981) that the first component was composed of BET, BIT and INFP, therefore this principle was referred to as "scanning". The second component was composed of OET, OIT and NAR, and was therefore referred to as "focusing". The first principle of this study has the common element of the direction dimension described by Nideffer (1976). Specifically, they represent the external direction dimension of attentional style. Thus, this principle component will be referred to as "externality".

The second principle relates to Nideffer's direction dimension and his breadth dimension. These subscales, RED and OIT are specifically, that of the internal and narrow attentional style. OIT is clearly an internal attentional style which measures the degree of being overloaded internally. The reduced subscale (RED), on the other hand, is a measure of a very narrowed attentional style. The athlete possessing this kind of attention is attending to irrelevant cues instead of relevant cues. This principle is referred to as an "inside-reduced" principle. The third principle (composed of NAR and RED) has the breadth dimension in common and will be referred to as a "focused" attentional style, in agreement with the Tennis TAIS (Van Schoyck & Grasha, 1981).

Construct validity was assessed further by the Wilcoxon Rank Sum Test and is presented in Tables 5 and 6. It was found that only the OET and NAR subscales of the B-Ball TAIS showed a significant difference between the three groups in terms of skill level. N-TAIS did not show a significant difference between any of the groups for any of the subscales. It must be noted that the INFP subscale of the B-Ball TAIS approaches significance at .0687. Therefore, it can be assumed that these subscales must be important in becoming good basketball players. It is open to discussion whether these subscales can or cannot be developed through basketball training. It is interesting that the OIT subscale did not show a significant difference between the three

groups. This finding may be due to the fact that such a subscale measure does not show improvement through training in basketball. The other explanation would be that the items on the B-Ball TAIS are not tapping this attentional style well enough and must be reviewed.

The Wilcoxon Rank Sum Test indicates that the B-Ball TAIS assesses basketball ability better than N-TAIS. This difference is not very strong and therefore should be accepted as such. As stated earlier, what is hypothesized to be the "elite" basketball player's profile is to have higher BET, BIT, NAR and INFP subscale scores and low OET, OIT and RED subscale scores. The B-Ball TAIS demonstrates this consistent relationship for all the subscales except OIT, BIT and INFP. Again, the internal dimension is not related to basketball ability. Perhaps, this is due to the fact that this subscale is an in-born trait as well, and is not developed as basketball players become better players.

N-TAIS demonstrates this consistent relationship, as well, except on the subscales, BET, BIT and NAR. However, the difference between the three groups is not a significant difference for N-TAIS, as mentioned above. Therefore, one can say that the B-Ball TAIS is able to more accurately measure the skill level differences in attentional style than N-TAIS as demonstrated in two out of the seven subscales of the B-Ball TAIS.

Table 5

Construct Validity: Wilcoxon Rank Sums (N=90)

B-Ball TAIS					
Subscale	Chi squ	Prob>Chi squ	Gr. 1	Gr. 2	Gr. 3
BET	1.14	.5643	48.50	46.47	41.53
BIT	^4.39	^.1115	41.03	42.22	53.25
OET	6.03	* .0490	36.20	48.30	52.00
OIT	1.05	.5903	47.20	41.53	47.77
NAR	6.28	* .0433	50.90	49.80	35.80
RED	2.66	.2644	39.35	47.25	49.90
INFP	5.36	.0687	47.20	52.30	37.00

*=significant difference at the .05 alpha level

^=approximate

Table 6

Wilcoxon Rank Sums for Nideffer's TAIS (N=90)

Subscale	Chi squ	Prob>Chi squ	Gr. 1	Gr. 2	Gr. 3
BET	3.78	.1512	52.20	39.18	45.12
BIT	4.39	.1115	53.62	41.18	41.70
OET	3.70	.1570	38.05	48.68	49.77
OIT	1.78	.4106	40.78	46.00	49.72
NAR	1.57	.4558	40.82	46.70	48.98
RED	4.38	.1120	37.40	49.02	50.08
INFP	3.8	.1496	52.97	42.90	40.63

NOTE: for above data chi square alpha statistic is 5.99

4.3 PREDICTIVE VALIDITY OF BOTH TESTS

Predictive validity was assessed through the Spearman Rho Correlations as presented in Table 7. Specifically, the rank-correlations were computed between an individual's ranking and the score on each subscale. The B-Ball TAIS showed a significant correlation for the subscales; BIT, OET and NAR. N-TAIS showed a significant correlation for the subscales; BIT, RED and INFP. Thus, both tests demonstrated some predictive validity although, in only three of the seven subscales. The average correlation coefficients for the B-Ball TAIS and N-TAIS were .19 and .17 respectively. The B-Ball TAIS has a slightly larger overall coefficient but it is not a significant difference. Therefore, it again must be concluded that both tests are low in predictive validity thus, should not be used for selection purposes. However, the option of using this test for individual counciling is still the main purpose of the test. It is suggested that before councilling an athlete, some feedback on the accuracy of his/her profile should be conducted before starting mental training that is indicated by the profile (Botteril, 1986).

Table 7

Predictive Validity

Spearman Rho Correlations (N=90)

	B-Ball TAIS		N-TAIS	
Subscale	Coefficient	P-Value	Coefficient	P-Value
BET	-.15811	.1367	-.11276	.2900
BIT	-.25563	* .0150	-.23815	* .0238
OET	.27383	* .0090	.19299	.0684
OIT	.02577	.8095	.10133	.3420
NAR	-.27299	* .0092	.14993	.1584
RED	.14258	.1801	.20950	* .0475
INFP	-.20016	.0585	-.21020	* .0468

* = significant difference at the .05 alpha level

Chapter V

SUMMARY AND CONCLUSIONS

5.1 SUMMARY

This study has presented an alternative method to measuring attentional style in an athletic situation. The purpose of the study was to design and validate a basketball version of Nideffer's Test of Attentional and Interpersonal Style. This modified TAIS, as a result, is a better measure of attentional style, in terms of assessing this trait in basketball players. The Basketball TAIS is a reliable test and as well has demonstrated some construct validity. It has also demonstrated predictive validity which was equal to that which was found in N-TAIS.

This study will benefit the coaches and athletes in the following ways:

1. It will allow the coach and athlete to administer a short test of attentional style, therefore it is more practical as a time saver.
2. It will identify the athletes strengths and weaknesses.
3. It will encourage coaches and athlete's to work on their weaknesses as demonstrated by the B-Ball TAIS.

4. It has the potential to identify changes in attentional style after an intervention period, if the treatment is successful. Thus, encouraging the athlete to keep working at it.

5. The B-Ball TAIS provides observable evidence to the coaches that there is a need for psychological training and that it is a trainable function.

5.2 CONCLUSIONS

1. The B-Ball TAIS was found to be a reliable test.

2. The B-Ball TAIS has confirmed the direction dimension of attentional style and showed some support for the breadth dimension.

3. Construct Validity exists for some subscales on the B-Ball TAIS.

4. The B-Ball TAIS showed some predictive validity in three of the seven subscales. N-TAIS showed the same amount of predictive validity but on a different combination of subscales.

5. The B-Ball TAIS demonstrates a more consistent relationship to basketball ability than N-TAIS.

5.3 RECOMMENDATIONS

1. The B-Ball TAIS should not be used for selection purposes.

2. The B-Ball TAIS will yield it's best results when used with committed athletes. This is clear because it is a self-administered test and it is dependent on the honesty and cooperation of the athlete.

3. The B-Ball TAIS will yield it's best results when used with athletes who have already attained the physical skills of the sport.

4. Future research in this area should include an increase in items on all of the subscales in order to tap all the situations which occur on the basketball court. This could result in a more complete measure of attentional style. However, the disadvantage of a larger instrument is that it is less practical in applied settings.

5. The B-Ball TAIS should be administered at the end of the season followed by the implementation of mental training based on the results of the profile. The mental training techniques work best when they are automated. If the automated stage is attained by the time the season starts, it will yield the best results.

REFERENCES

Agnew, N., & Agnew, M. (1963). Drive level effects on tasks of narrow and broad attention. Quarterly journal of experimental Psychology, 15, 58-62.

Allard, F., & Starkes, J.L. (1980). Perception in sport: volleyball. Journal of Sport Psychology, 2, 22-33.

Allard, F., Graham, S., & Parsalu, M.T. (1980). Perception in sport: basketball. Journal of Sport Psychology, 2, 14-21.

Bacon, J.J. (1974). Arousal and the range of cue utilization. Journal of Experimental Psychology, 12, 81-87.

Botteril, C. (1986). Personal Communication.

Botterill, C., & Winston, G. (1984). Psychological skill development. Sports Science Periodical on Research and Technology in Sport, August.

Broadbent, D. (1958). Perceptions and communication. London: Pergamon.

Broadbent, D. (1957). A mechanical model for human attention and immediate memory. Psychology Review, 64, 205-215.

Buceta, J.M. (1985). Some guidelines for the perception of stress in athletes. International Journal of Sport Psychology, 16, 46-58.

Coleman, J.A. (1980). Personality and stress in the shooting sports. Journal of Psychosomatic Research, 24, 287-296.

Cornsweet, D.M. (1969). Use of cues in the visual periphery under conditions of arousal. Journal of Experimental Psychology, 80, 14-18.

Crano, W.D. & Brewer, M.B. (1973). Principles of Research in Social Psychology. USA: McGraw-Hill Book Company, Inc.

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

Deutsch, J.A., & Deutsch, D. (1963). Attention: some theoretical considerations. Psychological Review, 70, 80-90.

Easterbrook, J.A. (1959). The effect of emotion on care utilization and the organization of behavior. Psychological Review, 66, 183-201.

Egeth, H. (1967). Selective attention. Psychological Bulletin, 67, 40-57.

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

Fisher (1982). Sport psychology comes of age in the '80s. American Psychological Association Monitor, September.

Goldberg, L.R. (1972). Some recent trends in personality assessment. Journal of Personality Assessment, 36, 547-560.

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

Jackson, D. (1971). The dynamics of structured personality tests. Psychological Review, 78, 229-248.

Kauss, D. (1978). An investigation of psychological states related to the psychoemotional readying procedures of competitive athletes. International Journal of Sport Psychology, 9, 134-145.

Kirschenbaum, D.S., & Bale, R. (1980). Cognitive-behavioral skills in golf: brain power golf. In R.M. Suinn (Ed.), Psychology in Sport, Minneapolis, Minnesota: Burgess Publishing Company.

Landers, D.M., & McCullagh, P.D. (1976). Social Facilitation of motor performance. Exercise and Social Science Review, 4, 125-162.

Landers. D.M. (1978). Motivation and performance: the role of arousal and attentional factors. W.F. Straub (Ed.), Sport psychology an analysis of athlete behavior. Ithaca, New York: Mouvement Publications.

Landers, D.M. (1982). Arousal, attention and skilled performance: further considerations. Quest, 33, 271-283.

McNamara, H.J., & Fisch, R.I. (1964). Effect of high and low motivation on two aspects of attention. Perceptual and Motor Skills, 19, 571-578.

Miller, B., Blackler, D., & Edwards, S. (1983). Sport psychology: attentional factors and success in hockey. Hockey Field, Oct., 39-40.

Murray, J.B. (1974). Renewed interest in attention. Psychological Reports, 34, 155-166.

National Coaching Certification Council (Eds.). National coaching certificate program: level III. Ottawa: Coaching Association of Canada, 1981.

Nideffer, R.M. (1983a). Psychological factors in diving. In D. Golden (Ed.), United States Diving Sports Sciences Seminar. (SIRC artivle number: GV838.58 18467)

Nideffer, R.M. (1983b). Tape entitled: Theories of Attention. Enhanced Performance Associates, San Diego, California.

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

Nideffer, R.M. (1980a). Attentional focus self-assessment. In R.M. Suinn (Ed.), Psychology in sport. Minneapolis, Minnesota: Burgess Publishing Company.

Nideffer, R.M. (1980b). Knute Rockne, John McKay and Arnold Schwartz. Coaching Review, Mar/April, 10-13.

Nideffer, R.M. (1979a). Mental preparation in sport. Neil,. (Ed.). National Coaches Conference in Ottawa. (SIRC article number: 046856).

Nideffer, R.M. (1979b). The role of attention in optimal athletic performance. In P. Klavora & J.V. Daniel (Eds.), Coach, athlete and the sport psychologist. Champaign, Ill.: Human Kinetics.

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

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

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

Nideffer, R.M. (1973). Test of Attentional and Interpersonal Style. San Diego, California: Enhanced Performance Associates.

Nideffer, R.M. (1971). Deep muscle relaxation on aid to diving. Coach and Athlete, March, 24 & 38.

Nideffer, R.M., & Sharpe, R.C. (1978). Attentional control training: how to get control of your mind through total concentration. New York: Wyden Books.

Norman, D.A. (1968). Toward a theory of memory and attention. Psychological Review, 75, 522-536.

Orlick, T. (1980). In pursuit of excellence. Ottawa: Canada Coaching Association.

Owen, H., & Lannina, W. (1982). The effects of three treatment methods upon anxiety and inappropriate attentional style among high school athletes. International Journal of Sport Psychology, 13, 154-162.

Posner, M.I., & Boies, S.J. (1971). Components of attention. Psychological Review, 78, 391-408.

Pratt, R.W., & Nideffer, R.M. (1981). Taking Care of business. Enhanced Performance Associates, San Diego, California.

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

Silva, J. (1979). Behavioral and situational factors affecing concentration and skill performance. Journal of Sport Psychology, 1, 221-227.

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

Turner, R.G., & Gilliland, L. (1977). Comparison of self-report and performance measures of attention. Perceptual and Motor Skills, 45, 409-410.

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

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

Wachtel, P.L. (1968). Anxiety, attention and coping with threat. Journal of Abnormal Psychology, 73, 137-143.

Walker,R., Nideffer, R.M., & Boomer, W. (1977). Diving performance as it is correlated with arousal and concentration time. Swimming Technique, 13, 117-119; 122.

Webster, R.G., & Haslerud, G.M. (1964). Influence on extreme peripheral vision of attention to a visual or auditory task. Journal of Experimental Psychology, 68, 269-272.

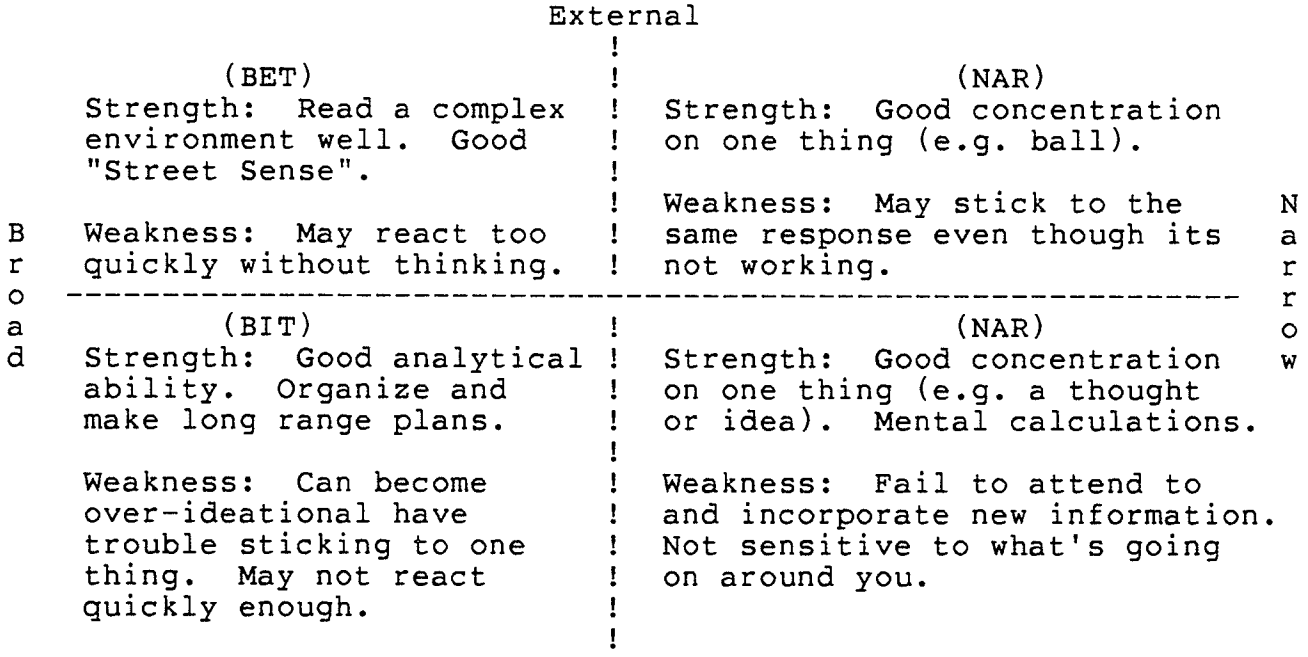
Weinberg, R.S. (1984). Mental preparation strategies. In J. Silva & R.S. Weinberg (Eds.). Psychological foundations of sport. Illinois: Human Kinetics Publishers, Inc.

Weltman, G., & Egstrom, G.H. (1966). Perceptual narrowing in novice divers. Human Factors, 8, 499-505.

Wine, J. (1971). Test anxiety and direction of attention. Psychological Bulletin, 76, 92-104.

Appendix A

ATTENTIONAL STYLES AND SUBSCALES



(Adapted from Nideffer, 1979a)

Figure 1: Attentional Dimensions

SUBSCALE DEFINITIONS

1. BET: Broad external focus of attention. High scores indicate the ability to deal with a large amount of environmental information at one time.
2. OET: Overloaded by external information: High scores indicate the person makes mistakes because they become overloaded by too much external information. They are distracted by irrelevant external information.
3. BIT: Broad internal focus of attention. High scores indicate the ability to analyze and make long range plans. This ability is associated with good organizational and intellectual functioning.
4. OIT: Overloaded by internal information. High scores make mistakes because they become distracted by their own thoughts and ideas.
5. NAR: Narrow focus of attention. High scores are associated with being able to concentrate on one thing, these people are dedicated, disciplined and usually follow through.
6. RED: Reduced focus of attention. High scores indicate the tendency to narrow too much. Individuals who are likely to choke score high on this scale.
7. INFP: Information processing. High scores think a lot and process a great deal of information.

TYPES OF CONCENTRATION

(a) Broad-Internal

This is an analytical attentional style, used to organize a large amount of information, for recalling the past and anticipating or planning for the future. It is the type of attention you would use to answer the question: "Write a brief interpretation of Canadian history from 1867 to present".

(b) Broad-External

This is the attentional focus used to rapidly assess a complex environmental situation. Salespersons, politicians, elementary school teachers, coaches and quarterbacks should be good at developing this type of attention.

(c) Narrow-Internal

This is the type of attentional focus a theoretical physicist uses, the type of attention you use to calculate figures in your head or contemplate your navel. Many individuals use this type of focus to calm "centre" themselves and build their resolve just prior to performing (e.g. Alexiev the Soviet weightlifter staring intently at the barbells prior to a lift).

(d) Narrow-External

This is the type of attention required of you as you react (especially physical movement) to the environment. The hitter in baseball, server in tennis, putter in golf,

all need a narrow-external focus. This is the same type of attention a surgeon uses or a jeweller.

(Adapted from Nideffer, 1979a)

Appendix B

ALTERED QUESTIONS FROM THE PILOT STUDY

Altered Questions from the Pilot Study

4. My thoughts are limited to what I am suppose to be doing at one point in time and not able to think ahead.

6. When I have the basketball I go through a series of options. For example, "Is the post open, 2. can I shoot 3. can I beat my man and 4. reverse the ball".

8. When I workout I seem to tune into what is going on around me only occassionally.

20. My understanding of basketball is narrower than most people.

33. It is easy for me to keep my mind on a single player in man to man defense.

34. I am good at quickly analyzing opposing basketball players and assessing strengths and weaknesses.

42. I have difficulty telling how my teammates feel by watching them and listening to them during the warm-up or in the game.

44. When the coach asks a question about a particular play we have covered, I can answer the question including irrelevant information.

55. My opponent sometimes talks to me during the game with insulting remarks and I can't tell whether he/she is smiling or listening to the tone of his/her voice.

Appendix C

SHORT VERSION OF NIDEFFER'S TAIS, THE BASKETBALL TAIS AND CLUSTERING OF THE SUBSCALES

Questions from the TAIS that were changed in the B-Ball

TAIS

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 surrounding.
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 colour 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.
24. It is easy for me to 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 information.
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 in those hidden figure drawings in children's magazines.
48. I get anxious and block out everything on tests.
49. Even when I am 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 lightheaded.

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 almost 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.

The Basketball TAIS

	NEVER	RARELY	SOMETIMES	FREQUENTLY	ALL THE TIME
1. When the coach gives me instructions I find myself distracted by the sights and sounds around me.	( )	( )	( )	( )	( )
2. When the coach or other players talk to me I find myself distracted by my own thoughts and ideas.	( )	( )	( )	( )	( )
3. All I need to know is what kind of pressure the other team is in and I can come up with many ways to break it.	( )	( )	( )	( )	( )
4. While practicing my thoughts are limited to what I am suppose to be doing and to activities occuring in my immediate surroundings.	( )	( )	( )	( )	( )
5. When I have the ball, I need to see where all my teammates are and their defense before I decide what to do.	( )	( )	( )	( )	( )
6. When I shoot the basketball my attention narrows on the target.	( )	( )	( )	( )	( )
7. When working on my game by myself I spend my time working at one exercise and then go on to another and return back to the original exercise.	( )	( )	( )	( )	( )
8. When other activities are going on around me, I can only focus on the task at hand for short periods of time.	( )	( )	( )	( )	( )
9. In practice all of the drills seem unrelated to playing the game of basketball.	( )	( )	( )	( )	( )
10. When I get the ball I think of so many things to do with it at once that I can't keep up with them.	( )	( )	( )	( )	( )

11.	The game seems to be very complex and confusing.	( ) ( ) ( ) ( ) ( )
12.	When I shoot foul shots it is easy to block out everything but the target I'm shooting at.	( ) ( ) ( ) ( ) ( )
13.	I focus on one thing in a game and miss things happening around it. For example; in the forward spot I look at my teammate in the low post and I can't see what the high post is doing or where the low post defense is.	( ) ( ) ( ) ( ) ( )
14.	I have difficulty clearing my mind when I make a mistake.	( ) ( ) ( ) ( ) ( )
15.	I think about one thing at a time when I'm playing basketball as opposed to having many ideas popping into my head.	( ) ( ) ( ) ( ) ( )
16.	I get caught up in my thoughts and therefore don't really see what is happening on the court.	( ) ( ) ( ) ( ) ( )
17.	I think alot about strategy and tactics.	( ) ( ) ( ) ( ) ( )
18.	The game of basketball is exciting and keeps me involved.	( ) ( ) ( ) ( ) ( )
19.	I understand the game of basketball better than most people.	( ) ( ) ( ) ( ) ( )
20.	I am only interested in basketball, unlike most people who have a much wider range of interests.	( ) ( ) ( ) ( ) ( )
21.	It is easy for me to direct my attention and focus only on the basket when I shoot.	( ) ( ) ( ) ( ) ( )
22.	It is easy for me to focus on the basket, my teammates and the defense, all at the same time.	( ) ( ) ( ) ( ) ( )
23.	It is easy for me to keep thoughts from interfering with my execution at the foul line.	( ) ( ) ( ) ( ) ( )
24.	It is easy for me to keep sights and sounds (audience) from interfering with my thoughts while shooting a free-throw or making an open lay-up.	( ) ( ) ( ) ( ) ( )

25. During the game if a baby started to cry in the stands it would grab my attention. ( ) ( ) ( ) ( ) ( )

26. It is easy for me to keep my mind on what I'm suppose to do next on offense. ( ) ( ) ( ) ( ) ( )

27. I am good at seeing the open man within the structured offense. ( ) ( ) ( ) ( ) ( )

28. With so much going on around me, it's difficult for me to think of what I'm suppose to do next. ( ) ( ) ( ) ( ) ( )

29. I am good at quickly analyzing the other teams offense and being able to anticipate what my opponent, I am guarding, is going to do. ( ) ( ) ( ) ( ) ( )

30. When I get the ball, I'm faced with so many options I can't make up my mind. ( ) ( ) ( ) ( ) ( )

31. When the other team presses on defense, get anxious and I'm not able to see as many things on the court as I normally can see. ( ) ( ) ( ) ( ) ( )

32. When looking up the court I know what everybody is doing (both teams). ( ) ( ) ( ) ( ) ( )

33. It is easy for me to keep my mind on my player in man to man defense when she has the ball. ( ) ( ) ( ) ( ) ( )

34. I am good at quickly analyzing what defense the other team is in and I know what set we should be in to break it. ( ) ( ) ( ) ( ) ( )

35. I get confused when I try to see what my teammates are doing and what the defense is doing, all at the same time. ( ) ( ) ( ) ( ) ( )

36. I have so many things on my mind when I play that I become confused and forget what I'm suppose to do next. ( ) ( ) ( ) ( ) ( )

37. When the coach asks a question about a particular play we have covered, I can get only part of the question correct. The coach always has to add 2 or 3 more points to my answer. ( ) ( ) ( ) ( ) ( )

38. It is easy for me to forget about mistakes I made on defense (offense) by concentrating on the offense (defense). ( ) ( ) ( ) ( ) ( )

39. In games I make mistakes because I watch what my teammate does but forget about the defense. ( ) ( ) ( ) ( ) ( )

40. I can anticipate what the offense is going to do before they do it. ( ) ( ) ( ) ( ) ( )

41. On the court I can keep track of what the defense is saying and what our offense is saying at the same time. ( ) ( ) ( ) ( ) ( )

42. In the warm-up or in a game, I don't notice my teammates. It is like I am playing by myself. ( ) ( ) ( ) ( ) ( )

43. At time-outs or half-time, I have difficulty listening to what the coach says because I'm distracted by irrelevant sights or sounds around me. ( ) ( ) ( ) ( ) ( )

44. When the coach asks a question about a particular play we have covered, my answer is too broad because I include too much irrelevant information. ( ) ( ) ( ) ( ) ( )

45. I make mistakes because I'm still thinking of the last play. ( ) ( ) ( ) ( ) ( )

46. I get confused when the play develops too quickly ie. fast break situations 3 on 2 or 4 on 3. ( ) ( ) ( ) ( ) ( )

47. I am good at seeing the open man even though it is not a part of the structured offense. ( ) ( ) ( ) ( ) ( )

48. I get anxious and block out what we are supposed to do on the court. ( ) ( ) ( ) ( ) ( )

49. When I am playing Basketball, my mind is going a mile a minute. ( ) ( ) ( ) ( ) ( )

50. I can figure out how to respond to my team-mates just by looking at them. ( ) ( ) ( ) ( ) ( )

51. I have a tendency to get involved with my own thoughts and forget important instruc-tions that were just discussed in the time-out. ( ) ( ) ( ) ( ) ( )

52. It is easy for me to bring together drills that we do in practice and relate them to what occurs in a game. ( ) ( ) ( ) ( ) ( )

53. Sometimes a pressing zone defense comes at ( ) ( ) ( ) ( ) ( )

me so fast that I become lightheaded.

54. The coach has to repeat instructions to me in time-outs because I get distracted by my own irrelevant thoughts. ( ) ( ) ( ) ( ) ( )

55. My opponent sometimes talks to me during the game with insulting remarks and I can't tell whether he/she is kidding, by listening to the tone of his/her voice. ( ) ( ) ( ) ( ) ( )

56. I can spend time with the ball just looking inside the key with my mind a complete blank except for reflecting the things that I see. ( ) ( ) ( ) ( ) ( )

57. I like to go out with my teammates. ( ) ( ) ( ) ( ) ( )

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

59. I am always on the go. ( ) ( ) ( ) ( ) ( )

Clustering of the Subscales

Question	Subscales	Question	Subscales
1	OET	19	BIT & INFP
2	OIT	20	NAR
3	BIT & INFP	21	NAR
4	NAR & RED	22	INFP & BIT
	INFP (4-0)		RED (4-0)
5	RED	23	NAR
6	NAR & RED		OIT (4-0)
7	OET	24	NAR
8	OET		OET (4-0)
9	INFP	25	OET
10	OIT	26	NAR
11	OET	27	NAR
12	NAR	28	OET
13	RED	29	BET, BIT & INFP
	INFP (4-0)	30	OET
14	RED	31	RED
15	NAR & RED	32	BET & INFP
	INFP (4-0)	33	NAR
16	OIT	34	BET & INFP
17	BIT & INFP	35	OET
18	INFP		

NOTE: All scoring for the likert scale is from 0 to 4 starting with never to all the time unless indicated otherwise.

Clustering of the Subscales (Continued)

Questions	Subscales	Question	Subscales
36	OIT	48	RED
37	RED	49	INFP
38	NAR & INFP	50	BET
39	RED	51	OIT & RED
	BIT (4-0)	52	BIT
40	BIT & INFP	53	OET
41	INFP	54	OIT
42	BET (4-0)	55	OIT
43	OET	56	RED
44	OIT	57	INFP
45	RED	58	INFP
46	OET	59	INFP
47	BET & INFP		

NOTE: The order of these question correspond to the order of the questions in both Nideffer's TAIS and the B-BAll TAIS as presented in this appendix.

Appendix D

INSTRUCTIONS TO THE SUBJECTS AND THE CONSENT FORM

Instructions to the Subjects

The questions you are about to answer are from a Test of Attentional and Interpersonal Style. This means that you will be answering questions based on your own abilities to look at something in its entirety or the ability to look at only a small section of it, in different situations. Other questions will involve your ability to look at thing going on around you and at other times concentrating on your own feelings. Answer the questions as truthfully as you can. These tests are not for purposes outside this study. They will not be used for any selection purposes in the future. I am the only one who will be able to attach a name to the results. Please do the test in the order that you received it. After the first test is completed, take a break and do the next test. Please, do not discuss your answers to the questions with anyone before you have completed both tests. After you have answered a full page of questions, do not go back and change your answers. Your first instinct is usually the best answer.

Consent Form

Adapted from Nideffer, 1981

Date_____

To be retained by the investigator:

Study Sign-up Form

My signature, on this sheet, indicates that I voluntarily consent to participate in a study on attentional style conducted by Cheryl Kryluk. The conductor indicates that I understand that all subjects in the projects are volunteers, that I can withdraw at any time from the study, that I have been or will be informed as to the nature of the study, that the data I provide will be anonymous and my identity will not be revealed without my permission. Finally, I shall be given an opportunity to ask questions prior to the start of the study and after my participation is complete.

_____ _____

Today's Date Subject's Signature
