ATTENTIONAL STYLES IN RUGBY PLAYERS.

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ABSTRACT

The purpose of this study was to determine the relationship between Nideffer's Test of Attentional and Interpersonal Style (TAIS) and success in the game of rugby, level of experience and position played within the sport.

One hundred and forty-four male volunteer rugby players from the Vancouver Island Rugby Union were administered the attentional subscales of the TAIS. The sample included 72 high ability players and 72 of average ability. Within each ability group subjects were further classified by age: Under 19 (U.19) years of age (n=24), Under 23 (U.23) years of age (n=24) and Senior (n=24). Four specific positional groups were identified within the sample: Tight Five (n=56), Back Row (n=24), Half Backs (n=20) and Threequarters (n=44).

A series of Two-way multivariate analyses of variance (MANOVAS) were performed on the data. No significant differences were observed between the two ability groups. These results replicate the findings of Van Schoyck and Grasha (1981) and Vallerand (1983). A significant difference was revealed when level of experience was considered ($F=1.80$, $p<.05$). The senior group was found to differ from both the U.19 and U.23 groups. Consistent with the observations of Richards and Landers (1979) and McKenna (1982), it was concluded that attentional differences exist between experienced and less experienced rugby players. Significant differences were observed between the Half Backs and the remaining positional

groups, on two of the six attentional subscales ($F=1.78$, $p<.05$). It was noted, that the Half Back group reflected most closely Nideffer's concept of an effective attentional style.

The study also produced additional support for the position of Etzel (1979), Van Schoyck and Grasha (1981) and Vallerand (1983), that attentional demands may be more complex than Nideffer's theory indicates. It was recommended that future research should focus on the underlying dimensionality of attention, and that sports-specific measures may be more precise indicators of attentional style in athletes, than is the present general TAIS test.

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DEDICATION

To Bill - Thanks for the opportunity.

Chapter I

INTRODUCTION

Among the many psychological variables that have been studied in the area of human performance, the field of attention is of particular importance. Nideffer (1976a) has claimed, "it is hard to imagine a variable more central to performance than the ability to direct and control one's attention." This contention has also been extended to the field of sport. For example, Roberts, Spink and Pemberton (1986, p.121) have asserted that regardless of whether an individual is learning or performing in a sport setting, attention to the most appropriate cues remains a critical variable. Although the importance of attentional factors in sport performance has been recognized by athletes and coaches, little research has been reported by sports psychologists in the investigation of the attention-performance relationship (Nideffer, 1976a).

The concept of attention can be viewed in at least two distinct ways according to Reis and Bird (1982, p.64). From the information processing viewpoint, attention is said to be the process that actively selects the input to, operation in, and response from the central operating space, thereby determining the direction of behavior (Kahneman, 1973; Klein, 1976). Differential psychology, in contrast, proposes that individuals have a characteristic style of attending to stimuli, which is viewed as a personality trait or individual difference variable. Furthermore, it has been proposed that some persons generally attend to stimuli in a very broad,

externally-oriented manner, while others tend to be narrow in attentional scope and more introspective. Because of this, it is assumed that people with different attentional styles will process different cues (Bird & Cripe, 1986, p.147).

Based upon theoretical constructs proposed by Broadbent (1957), and upon reviews by Silverman (1964) and Wachtel (1967), Nideffer (1973, 1976c, 1981) developed a theory of attention. His theory states that attention can be dichotomized in two dimensions. The first dimension can be viewed as an internal-external continuum in which the focus of attention is directed either toward the individual, or at the external environment. The second dimension refers to the width of the focus (narrow to broad), indicating the number of elements one can attend to in a stimulus field. A narrow focus of attention would facilitate performance in a situation which demands concentration on limited stimuli (for example, a free-throw in basketball). Conversely, during a football game the quarterback must frequently attend to a number of incoming stimuli and make his decisions accordingly. This situation would require a broad focus of attention.

In an attempt to assess these hypothesized individual differences, Nideffer (1976b, 1976c) developed a personality inventory, the Test of Attentional and Interpersonal Style (TAIS). The test contains 17 scales, six assessing attentional processes, two involved with behavioral and cognitive control, and nine mapping interpersonal style (Van Schoyck & Grasha, 1981).

Nideffer suggests that certain sports require a particular integration of the direction (internal to external) dimension with the focal width dimension, in order for an individual to perform adequately. He further proposed, that for an individual to function effectively that person's attention must correspond to the environ-

mental demands; should that not be the case, mistakes will occur. An appropriate attentional style, therefore, would seem to be an important determinant of sport performance.

The TAIS has been used with swimmers (Nideffer, 1976c), riflemen (Richards & Landers, 1979), soccer players (Taylor, 1980), golfers (Kirschenbaum & Bale, 1980), basketball players (Vallarand, 1983) and tennis players (Van Schoyck & Grasha, 1981). However, to date, there are no data which describe the attentional styles of rugby players. Because the game of rugby would appear to have very high attentional requirements, research assessing the relationship between attentional styles and performance may have important implications for the sport.

Purpose of the Study

Empirical support for the relationship between attentional style and performance is equivocal. Nideffer (1976c), and Richards & Landers (1979) suggest that attentional differences as measured by the TAIS seem to exist between good and average performers. However, in a more recent study Van Schoyck and Grasha (1981) demonstrated that the TAIS did not differentiate among tennis players of three different skill levels. For this reason the current research has been formulated to test the TAIS as a predictor of athletic performance within the rugby environment.

Since the nature of the game of rugby is very complex, success in playing the sport may be related to attentional style. The primary purpose of this study, was to compare the attentional profiles of high ability players to those of average ability. In this way, the research investigated, within a rugby environment,

Nideffer's (1976b) assertion that attentional style may be utilized to predict level of performance. Experience in a given sport is another variable that may modify, or be modified, by attentional style (Van Schoyck & Grasha, 1981). The second purpose of the study, then, was to investigate the relationships of attentional styles of rugby players at three different levels of experience. The third purpose of this study is to determine the relationship between attentional style in rugby players and team positions.

There are a number of distinctive positional roles which appear to demand different styles of attention to accomplish their responsibilities within the game. The main duties of the "tight five forwards" within rugby are concerned with obtaining possession of the ball. These players, similar in role and stature to the defensive linemen of football, require large body mass and muscular power. A second group are the "back row" players who can be likened to football linebackers in that both groups are required to exercise mobility on attack and defence. A third distinct group are the "half backs", who, like the quarterback, determine distribution of the ball, and direction of attack. The remaining group of "threeq-uarters", like running backs and wide receivers in football need to be fast and elu-sive runners to best achieve their postional responsibilities.

Definition of Terms

For the purpose of this study the following definitions were used.

1. ATTENTIONAL STYLE is defined as "a person's characteristic manner of observing the environment. These observational compentencies are divid-ed into a two-dimensional matrix of width (narrow to broad) and direction (internal to external)." (Bird & Cripe, 1986, p.147)

2. SELECTIVE ATTENTION refers to "the process of attending to one set of cues to the exclusion of other cues." (Bird & Cripe, 1986, p.148)

3. HIGH ABILITY RUGBY PLAYERS refers to "those players who are currently playing representative rugby for Vancouver Island, at Under 19 years of age (U.19), Under 23 years of age (U.23), or Senior levels."[1]

4. AVERAGE ABILITY RUGBY PLAYERS refers to "those players who are currently playing for clubs within the Vancouver Island Rugby Union, but have never been selected or performed at a representative level." [1]

Chapter II

REVIEW OF LITERATURE

The review of literature is organized into three sections. The first of these discusses the current status and future direction of personality research in sport, the second reviews theories of attention including the development of TAIS, and the third examines the use of TAIS in sport. A summary of the important findings of the review are presented at the conclusion of the chapter, and formulated as questions for the current study.

Athletic Performance and Personality

There are numerous personality paradigms within psychology including the psychodynamic, phenomenological, constitutional (body type) and social learning models. Two theories have come to dominate sports personology within the field of sports psychology (Endler & Magnusson, 1976). These have been identified as the 'trait' and 'interactional' paradigms.

The trait theory views the individual as the primary determinant of behavior and finds consistencies in behavior across a variety of situations. The theory contends that personality traits are generalizable and allows for the prediction of behavior even in normal situations (Silva, 1984). Because this approach takes little or no account of the many situational variables that can influence behavior, disagreement has arisen among sport psychologists regarding the usefulness of trait psychology.

Morgan (1980) and Kane (1981) have defended the use of trait theory in predicting behavior and noted that various personality traits have been observed to account for 20% to 45% of the variance in sport performance. In contrast, sport psychologists such as Rushall (1970), Martens (1975), and Kroll (1976) have argued that trait psychology should be abandoned. Martens (1975) has documented the methodological problems that have plagued the sport personality research which utilizes the trait approach. He cited reliance on univariate statistical analyses of a multivariate problem, questionable sampling techniques, and the lack of a systematic examination of sports at various competitive levels as obvious shortcomings of research.

As a result many scholars have turned to the 'Individual Difference Framework' (Bird & Cripe, 1986, p.38) of the interactionist perspective. The interactional model (Mischel, 1973 ; Endler, 1975) emphasizes the importance of person-situation interactions in determining personality characteristics. Endler (1975) stated that:

> Behavior involves an indispensable, continuous interaction between individuals and the situations they encounter. Not only is people's behavior influenced by significant features of the situations they encounter, but they also select the situations in which they perform, and subsequently effect the character of these situations. (p.16)

In an attempt to resolve the issue of whether situations or persons were of greater relative importance in determining behavior, Endler and Hunt (1973) developed a series of self-report inventories (eg. the S-R Inventory of Anxiousness). Their results allowed them to determine the relative impact of the situation, the person and the interaction. It seems that person (20%) and interaction (26%) are equally important whilst situation, at 12% is of slightly less conse-

quence. The relatively low percentage of performance variation attributable to person factors gives further insight into why a trait approach considering person factors only and ignoring situation determinants has produced limited results. The interactionist paradigm, simultaneously taking into account the person, the situation, and their interaction, will invariably explain more of the variance in sports behavior.

A second major difference between the two perspectives is that many personality traits are tested within trait theory, whereas the individual difference strategy selects one or two variables only and examines their relationship to sport behavior. Bird and Cripe (1986, p.37) cited imagery and attentional styles as the most promising individual difference or personality variables for providing further insight into individual sport behavior. They suggested that there is a need in the future for increased application of these variables in comparing male and female sports groups at all levels of achievement.

Theories of Attention

Wachtel (1967, p.418) stated that "the study of attention is essentially the study of selectivity in perception and cognition and in variations in overall responsiveness to stimulation." Selective attention is the ability to process only a certain amount of the information received at any time while ignoring or rejecting the remainder of the stimuli.

Broadbent (1957) proposed the filter theory to describe the selective processes of the human perceptual system. Moray (1972) explained the filter system as a blockage or bottleneck which occurs at some point in the nervous system as two

messages arrive simultaneously. This causes a distraction effect and, ultimately allows only a portion of the information to be processed at one time. One message is transmitted immediately while the other message is held in the short-term memory store until the input line is free. Both theorists concurred that because of the human nervous system's limited capacity all information received by the sensory system cannot be analyzed at one time. It is difficult to attend to two complex tasks at once unless the tasks are familiar or well learned, and, consequently, require little attentive effort.

Broadbent's theory suggests an early selection process, prior to the identification of the meaning of the message, and avoids explanations for more complex discriminations. One such complex discrimination has been described as the 'Cocktail Party phenomenon' (Magill, 1980). This phenomenon occurs in a situation in which an individual is capable of attentively concentrating on a conversation despite the noise and distractions of a party environment. The casual mention of the person's name, however, elicits an immediate response from the individual. Implicit in this description are two assumptions: (1) one has the ability to selectively attend to a single message from among a number of competing messages and (2) a person can immediately shift attention to meaningful cues when he/she is not being selectively involved. In both situations, the relevancy of the message is critical.

Deutsch and Deutsch (1966) suggested that all messages reach the perceptual mechanism, at which point the information is grouped and weighted. Only the significant inputs, however, are acted upon or remembered. Not unlike the theory of Deutsch and Deutsch, Norman's (1968) theory of selective attention is based

upon the concept of pertinence. All signals reaching the sensory receptors are analyzed and they activate those signals that have previously penetrated the memory store. Only that information which is most relevant to the situation is selected for further processing.

Norman observed that if two verbal messages are received simultaneously, with priority instructions to respond to a task given by one of the messages, the subject is generally able to recall little of the unattended message. Such results imply the existence of a single channel of attention with a limited capacity to process information. The subject accepts one message and rejects or ignores the other. He further claimed that the realization of the relevancy of the information itself presupposes some degree of analysis of the input, thus suggesting the efficiency and capability of the selective mechanism to choose the desired input prior to involvement by the attentional mechanism.

Magill (1980) summarized the merits of each of the major theoretical positions. He concluded that: (1) there appears to be instances in which information is blocked from further processing on the basis of the sensory cues only, (2) the human perceptual system is capable of attending to one cue from among a variety of cues, (3) the relevancy of the message may divert attention and irrelevant input may be blocked out or rejected and (4) the limited capacity allows for two tasks to be performed simultaneously if the secondary task does not require full attention.

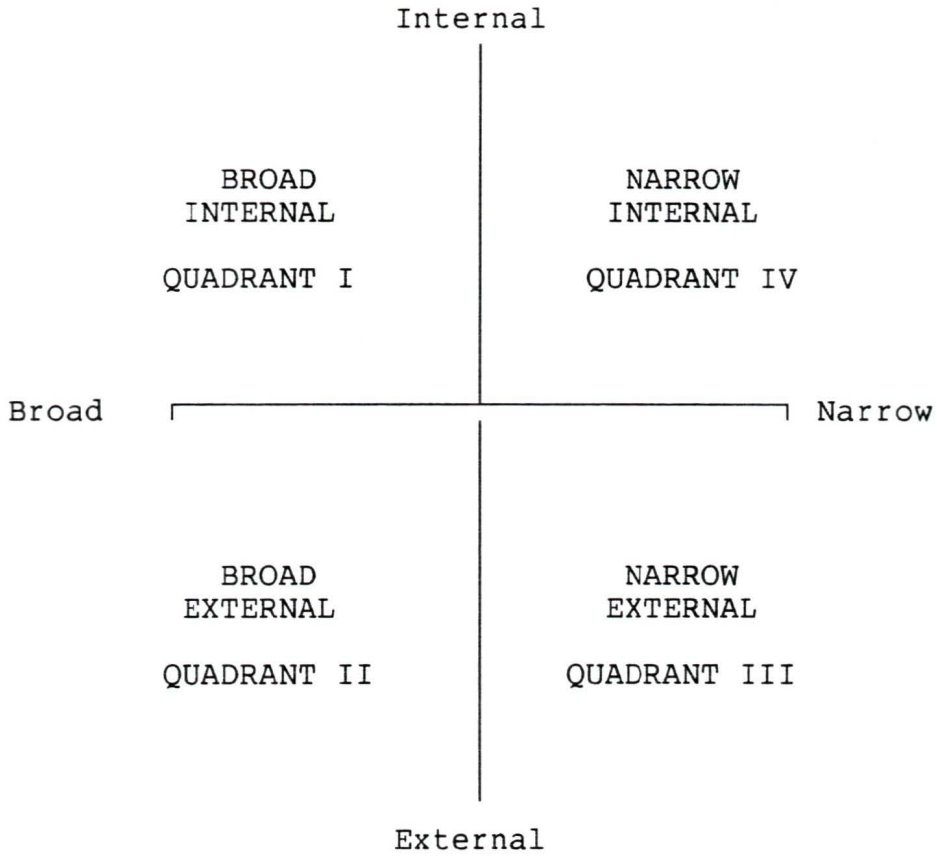
Magill (1980) also applied these theories to the athlete and stated that the selection of, and attention to, appropriate stimuli while ignoring or rejecting irrelevant cues is crucial to effective sport participation. Even for the highly skilled performer, initiation of a movement requires attention to the appropriate cues.

Within a framework of differential psychology, Nideffer (1976c) developed his two dimensional model of attention. One dimension, the width of attention or the amount of information attended to, is depicted as a continuum encompassing a broad to narrow range. A narrow focus of attention is characterized by a high degree of concentration with energy flowing in one direction; full control of this capacity would conceivably occur only under ideal conditions. Such a focus would facilitate performance when the situation demands concentration on limited stimuli. The execution of free throws in basketball, especially in a high-pressure situation, typifies a condition in which a narrow focus is necessary. Certain competitive situations, in contrast, would be hampered by a narrow focus. The quarterback of a football team or the right wing of a soccer team must frequently attend to a number of incoming stimuli and make his decisions accordingly. These situations would require a broad focus of attention.

A second dimension of attention is the direction toward which one's attention is focussed. The direction may be either external, towards one's environment, or internal, towards one's own thoughts and feelings. Most competetive situations require the ability to shift attention from one dimension to another or to shift within each dimension (Nideffer, 1976c).

Nideffer's model of attention is illusrated in Figure 1. A broad-internal focus of attention, depicted in quadrant I, describes the ability to absorb and react analytically to a number of incoming stimuli. Quadrant II, the broad-external style, represents the type of attention necessary to cope with a dynamic or complex environment. The narrow-external focus of quadrant III is one in which response to only a few cues is necessary to facilitate performance. Quadrant IV describes the situation in which introspective thought enhances performance outcome.

Figure 1: Nideffer's Model of Attention



Nideffer (1976b) used golf to exemplify a series of attentional shifts. Selection of a golf club requires a broad-external focus to take into consideration certain factors such as distance, the lie of the ball, weather conditions and locations of hazards. A broad-internal focus then becomes necessary to integrate this new information with what is already known of past performance under similar conditions. Once the situation is analyzed, attention must focus narrowly and externally on the execution of the swing itself, rejecting irrelevant thoughts. Following the shot, a narrow-internal review may be necessary to evaluate and mentally replay the performance.

Nideffer (1976a) contended that attentional style may be utilized to predict performance across a variety of situations. The concept that performance may be predicted on the basis of attentional processes suggests that the ability to control focus of attention is constant across competitive situations.

Nideffer (1980c) further suggested that individuals have a dominant style of attention and, consequently, tend to demonstrate certain related strengths and weaknesses. Nideffer (1981b) hypothesized that when under pressure or in stressful conditions, athletes find it increasingly difficult to control and shift attention, and at such times are more likely to rely on their dominant style. Nideffer (1981b) also recognized the implications that an attentional focus which is either too broad or too narrow would have. Too broad a focus allows an overload of information to interfere with appropriate decision making; too narrow a focus causes one to become overly analytical in assessing the situation.

In order to assess attentional and interpersonal factors, Nideffer (1973) developed a paper-pencil inventory : the Test of Attentional and Interpersonal Style

(TAIS). The aims of the TAIS are threefold : (1) to provide a conceptual basis for understanding what abilities are necessary for effectiveness in any clearly specified job or performance situation, (2) to measure those attributes which allow predictions to be made about the probable effectiveness of the respondent, and (3) to be used as a basis for developing and assigning treatment and/or training programs based on the individual's current level of functioning.

The test incorporates a broad range of life situations which reflect three effective and three ineffective types of attentional behavior. The former three include a broad-external focus (BET), a broad-internal focus (BIT), and a narrow-external and internal focus (NAR), while the latter involve an over-inclusive external focus (OET), an over-inclusive internal focus (OIT), and an under-inclusive external and internal focus (RED).

A broad bandwidth is contrasted with the external and internal directional focus in the scales, BET and BIT. The inability to distinguish task relevant cues (for instance, the over-inclusion of stimuli) is manifested by scales OET and OIT. The opposite end of the range, involved with the narrowing of one's attention, is assessed in scales RED and NAR. Too much filtering excludes necessary stimuli, as measured by scale RED. Scale NAR reflects the capacity to appropriately narrow attentional focus and is a measure of the positive aspects of attention, while scale RED reflects instances of failure to include task relevant information. Since no distinction is made between narrow-external and narrow-internal, scales RED and NAR are assumed to apply equally to both external and internal narrowing of attention (Mann, 1984).

In summary, scales BET and BIT are compared to determine the athlete's predisposition to a particular directional preference, external to internal. The comparison between the sets of paired scales BET/OET, BIT/OIT and NAR/RED, reflect an individual's attentional competencies along the bandwidth dimension.

The use of the TAIS in Sport

The TAIS has been reported to be an effective device for predicting the differences between good and poor college-level competitive swimmers (Nideffer, 1976c). Swimmers scoring high on the TAIS scale measuring the tendency to make errors of under-inclusion were rated by the coach as (a) losing control and concentration under pressure (r=.75), (b) falling apart if they make early performance errors (r=.59), (c) having to work hard for everything they obtain (r=.66) and (d) being worried about one particular thing and being unable to think of anything else (r=.80). In addition, scores of swimmers rated by coaches as inconsistent, correlated with the subscales of the TAIS in the area of external overload (r=.60), internal overload (r=.67), integrating thoughts (r=.63) and being unable to effectively narrow attention (r=.63).

Aronson (1981) and Zaichowsky (1980) studied the attentional processes of gymnasts and elite track athletes, respectively, and found the TAIS to be a strong predictor of successful performance. Using discriminant function and multiple regression techniques, the investigators found, independently, that the TAIS was associated with 40-60 percent of the performance variance.

Landers et al (1981) used 500 subjects to compare elite and non-elite shooters performing open and closed skills. Results showed that there were no differences

between males and females in either open or closed skills. Elite shooters were significantly less likely to be overloaded with external stimuli, as well as less likely to make mistakes because they narrowed attention too much, thereby excluding appropriate cues (RED scale on the TAIS).

Jackson (1980) found that the test was able to successfully differentiate between competitive female sprint swimmers, distance swimmers and a control group of non-athletes. Similarly, Taylor (1980) found that the TAIS was able to reveal significant differences between two ability levels in soccer.

In contrast to these results, there have been studies which failed to replicate the discriminatory functions of the TAIS. Vallarand (1983), when assessing attentional style and decision-making in performers of different ability levels, found the TAIS sub-scales unable to differentiate between ability groups. In particular, Vallarand investigated the "scan" (higher BET, BIT, INFP scales) and "focus" (low OET, and OIT, but high NAR scales) factors of performers in the basketball situation. No differences were found between three ability groups in terms of these factors.

Other researchers (Landers, Furst and Daniels, 1981; Van Schoyck and Grasha, 1981; Etzel, 1979) have questioned aspects of the underlying attentional dimensions of the TAIS as proposed by Nideffer. These studies, using the TAIS, have all revealed a multidimensional aspect inherent in the attentional phenomenon (Mann, 1984). Van Schoyck and Grasha (1980), categorizing 90 subjects in three different skill levels, sought to examine the way in which attentional processes vary as a function of one's skill. As part of the study, the investigators developed a sport-specific measure for tennis (T-TAIS), adapted directly from the TAIS. The authors

proposed that Nideffer's two-dimensional model of attentional style should be supported by the nature of the intercorrelations among the subscales. Intercorrelations for many of the subscales on both instruments were high, thus suggesting the subscales are not independent. Both attentional dimensions, direction and width, were also found within the same scales (BET, BIT, OET and OIT) of the TAIS.

Van Schoyck and Grasha contended that if the direction and bandwidth of attention were adequately assessed by the TAIS and T-TAIS, the subscales possessing the two dimensions would be negatively correlated. Results revealed high positive correlations for the directional attentional elements, indicating common factors among subscale pairs (BET, BIT and OET,OIT). The conclusions implied direction may not be a significant component of the scales and the concept of width may be multidimensional.

Two studies have reported a relationship between the TAIS and level of experience. In an investigation of 159 elite and non-elite shooters (male and female), Richards and Landers (1979) examined relationships between scores on the TAIS scale and several other variables including level of experience, shooting disciplines, gender and competitive scores. Less experienced shooters were shown to be overloaded with external stimuli. Males, in contrast to females, were more impulsive, had a more effective broad-internal focus and had higher self-esteem.

A second study to investigate the relationship between attentional style and experience was conducted by McKenna (1982). The researcher concluded that attentional differences existed between experienced and inexperienced Australian footballers, and indicated the TAIS was sufficiently sensitive to differentiate

between the two groups. These results indicate that level of experience may be a variable on which the TAIS can discriminate between groups.

A third variable that may be particularly pertinent to rugby is that of the position played within the game (because of their distinctive demands). Nation and LeUnes (1983) demonstrated that the Profile of Mood States (POMS) inventory clearly discriminated between players homogeneously grouped by position in football. A similar approach employing the TAIS with rugby players, may indicate whether attentional styles differ from position to position within the game of rugby.

The ambiguous nature of some results and of research using the TAIS questions the validity of the instrument, but, as Bond (1985) concluded, the use of the test as a research tool and as a focus of further research itself, must continue to be encouraged. He further stated:

> We are a long way yet from general acceptance of a clear, concise, applied theory of attention in human performance situations. Nideffer's work is to be commended for establishing a useful starting point in the research aspects of this area. (p.5)

Summary

The selection of and attention to appropriate stimuli, while ignoring or rejecting irrelevant cues, would seem to be crucial to effective sport participation. The ability to shift attention may also be critical for proficient performance, because, as Landers (1980) reported, attentional demands differ from sport to sport itself.

Empirical support for the relationship between attentional style and performance is equivocal. The need for further research in this area is apparent. There-

fore, this research has been formulated to add to the understanding of the TAIS as a predictor of athletic performance.

Experience is a second variable that has been shown to differentiate individual capabilities, an explanation being that attentional style may be modified through experience of a given sport (Van Schoyck & Grasha, 1981). The distinctive positional roles is a third variable within rugby, on which players may differ according to homogeneous groupings. It would appear the various positions may require particular styles of attention to better accomplish their responsibilities within the game.

The results of the study by Van Schoyck and Grasha (1981) indicated that intercorrelations among the attentional subscales did not describe Nideffer's dimensions of attentional style. A further examination of the interscale correlations, as scored by rugby players, will add insight to an understanding of the major features of attentional style.

The following specific research questions have been formulated from this review of the literature :

1. Does attentional style, as measured by the TAIS, differ between high (representative level) and average ability rugby players ?
2. Is attentional style, as measured by the TAIS, related to the experience of rugby players ? (across three classifications:- Under 19 {U.19}, Under 23 {U.23} and 'Senior' age levels).
3. Do specific positional groups differ on attentional style as measured by the TAIS ?

4. Do relationships between the attentional subscales of the TAIS, as responded to by rugby players, describe the main features of attentional style suggested by Nideffer ?

Chapter III

METHOD

The procedures used in this investigation are presented within this chapter. A brief discussion is given concerning the subjects, measuring instrument, data collection procedures, delimitation and limitations of the research, study design and statistical analyses.

Subjects

The subjects were 144 male rugby players. The sample was selected to include 72 high ability rugby players and 72 of average ability. Within each ability group subjects were further classified by age: Under 19 years of age, Under 23 years of age (both as of January 1st 1986), and Senior. All subjects were volunteers and all were informed of the general purpose of the study.

Instrumentation

The Test of Attentional and Interpersonal Style is a written inventory developed to measure attentional and interpersonal characteristics which are believed to be significant determinants of the ability to make decisions, the ability to function under pressure, and the ability to analyze environmental situations and integrate information (Nideffer, 1976b, 1981b). The TAIS was established on the basis of current attentional theory with logical relationships existing between the test items, the objectives of the test, and actual behavior (Nideffer, 1981a).

Validity of the TAIS

Concurrent validity was determined by the correlation of the TAIS scores with other psychological measurements including the Minnesota Multiphasic Personality Inventory (MMPI), Rotter's External-Internal Scale, the Taylor Manifest Anxiety Scale (MAS), the Weschler Adult Intelligence Scale, and the Spielberger State-Trait Anxiety Inventory (STAI). Interscale correlations between the TAIS and the above instruments were found suitable to determine good concurrent validity (Nideffer, 1976a). Construct validity has been assessed by studies which show that the TAIS discriminates between various populations. In the field of sport the TAIS has been shown to discriminate between elite and non-elite athletes (Nideffer, 1981b ; Landers, Furst and Daniels, 1981). Additional studies used the TAIS to determine differences in male and female responses and the responses of non-athletes and athletes (Nideffer, 1981b). The results indicated a tendency for women to score lower on the ability to develop a broad-internal focus (BIT), to become overloaded more easily, and to have more difficulty narrowing attention. Test score differences between non-athletes and athletes have indicated both male and female athletes were better able to narrow attention, when compared with the non-athlete group.

Predictive validity has been examined by using TAIS scores to predict subsequent performances in areas such as athletics (Nideffer, 1981b ; Landers, Furst and Daniels, 1981), executive management and police officer selections (Nideffer, 1981b).

While these initial studies have given encouragement that the test has been able to discriminate between groups, results have not always been consistent. For this reason the validity of the instrument remains in some doubt.

Reliability of the TAIS

The TAIS consists of 17 conceptually and statistically independent subscales (Nideffer, 1976a). The overall median coefficient for two-week test-retest reliability was .83. Correlations ranged from a low of .60 on the obsessive scale to .93 on physical orientation. One year test-retest reliability estimates yielded a coefficient of .76 (Nideffer, 1981b). These reliability coefficients suggest the suitability of the TAIS as an effective measure of attentional personality characteristics (Vallerand, 1983).

Scoring of the TAIS

Responses to each test item are chosen according to frequency of occurrence and are graded as follows: never, rarely, sometimes, frequently, always. The subject's response to each item is assigned a numerical value of zero to four. A response of 'never' is assigned a zero, and a response of 'always' receives a four. Certain test items are scored in the reverse direction or scored on two different subscales, such as broad-external (BET) and external overload (OET). In these cases, both scales are designated differently to allow inclusion of the response on each scale. For example, a response of rarely (1) on the BET scale is recorded as frequently (3) on the OET subscale. Scores for each subscale are totalled. The sum of the items for each subscale is then plotted on the individual profile sheet. According to Nideffer (1973) the profile sheet allows interpretation of standardized scores, or 'z' scores ($z = \{ \text{raw score} - \text{mean} \} / \text{standard deviation}$) and 'T' scores ($T = 10z + 50$).

The attentional components of the TAIS were extracted from the general assessment for utilization during the testing procedure. (See Table 1 and Appendix A).

Table 1: The TAIS Attentional Subscale Definitions

Scale	Abbreviation	Description
Broad External Focus of Attention	BET	High scores indicate the ability to deal with a large amount of environmental information at one time.
Overloaded by External Information	OET	High scores indicate the person makes mistakes because they become overloaded by too much external information.
Broad Internal Focus of Attention	BIT	High scores indicate the ability to effectively integrate ideas and information from several different areas.
Overloaded by Internal Information	OIT	High scorers make mistakes because they become distracted by their own thoughts and ideas.
Narrow Attentional Focus	NAR	High scores are associated with being able to concentrate on one thing effectively (narrow attention when needed).
Reduced Attentional Focus	RED	High scores indicate that individuals make mistakes because they narrow their attention too much.

Data Collection Procedures

The support and co-operation of the Vancouver Island Rugby Union Executive was gained on December 3rd 1985. The permission of the Crimson Tide (Vancouver Island representative rugby teams) coaching staff, and coaching staff of rugby clubs whose players were to participate in the study was also obtained before individual subjects were approached. (See Appendix B)

All data were collected over a three month period from the beginning of January 1986, to the end of March 1986. As the last Crimson Tide fixture was on Febuary 8th 1986, early priority in the testing schedule was given to the high ability subjects. Data collection from the average ability sample was accomplished during the latter period of testing.

Data pertaining to the athletes were collected using the following procedure:

1. Initial contact with the subjects was made on 'match days' or team training nights. It took place at a time convenient for both the coach and the team, in order to prevent disruption.
2. The TAIS was introduced and explained in a standardized manner, and the nature and purpose of the study outlined.
3. It was stressed that each individual's data would remain confidential and that anonymity in results would be assured.
4. Consent forms were issued with tests (See Appendix C) and where subjects indicated immediate response to the questionnaire was not possible, stamp-addressed envelopes were enclosed.
5. A follow-up procedure was adopted in all cases if the questionnaires were not returned to the reseacher within two weeks. This involved a tele-

phone call to ascertain if subjects had decided to withdraw from the study.

Limitations

The following limitations occurred in this study:

1. The study was limited by the appropriateness of the test instrument and the willingness of the subjects to give unbiased responses.
2. The study was limited by the lack of uniform response conditions for the subjects, and by the extended nature of the testing period.
3. The external validity of the study was limited by the lack of a random sample.
4. The limited number of previous studies related to the attentional phenomenon further restricts the generality of the conclusions.

Design and Statistical Analyses

The major purpose of this study was to discover if groups could be discriminated between on the basis of attentional style. In this case rugby players were investigated in terms of their level of ability, experience within the game of rugby and position played. These three factors were established as the independent variables for the consequent analyses. The dependent variables were the six scores of the attentional subscales of the TAIS.

A series of three Two-way multivariate analyses of variance (Manovas) were conducted to determine main and interaction effects for each of the independent variables. An alpha level of $p<.05$ was selected as the significance criteria. As

significant differences were revealed, analyses of variance (Anovas) and Scheffe's test of multiple comparisons were calculated. Descriptive statistics were also obtained for each of the research questions. Pearson product-moment correlation coefficients were computed to establish the associations between the dependent variables.

Chapter I

RESULTS AND DISCUSSION

The means and standard deviations for each ability group at each level of experience, and for each positional group are presented in Table 2. A series of Three-way Manovas (ability, experience and position) were initially computed (See Table 3) to establish an overview of the associations and differences among the independent variables.

Due to the small cell sample size within the three-factor Manova, a further analysis was computed employing a series of Two-way Manovas. This technique of collapsing the analyses on one of the independent variables ensured that an adequate cell sample size was maintained, which added power to the statistical procedure. Ability was combined with Position (See Table 4), Ability with Experience (See Table 5), and Position with Experience (See Table 6). Subsequent analyses and interpretation were confined to the results of the Two-way Manovas.

Table 2: The Means and Standard Deviations for each ability group, at each level of experience, and for each positional group.

(a) On the dependent variables BET, OET and BIT (n=144)

Group		BET			OET		BIT	
		(n)	M.	S.D.	M.	S.D.	M.	S.D.
High Ability								
	(S)	10	19.30	1.77	27.40	4.97	25.00	2.66
T.F.	(U.23)	11	21.90	2.38	28.18	4.81	24.63	2.20
	(U.19)	5	19.80	2.17	27.80	5.54	25.20	3.70
	(S)	4	20.75	2.22	29.00	4.08	23.75	1.70
B.R.	(U.23)	3	22.33	3.05	30.33	2.08	29.00	4.35
	(U.19)	6	21.33	3.77	30.66	3.82	27.50	2.88
	(S)	4	23.75	1.89	25.50	4.20	25.25	2.98
H.B.	(U.23)	4	23.00	1.82	29.50	7.85	27.50	2.38
	(U.19)	3	21.66	3.21	29.33	2.88	26.00	2.00
	(S)	6	20.00	3.79	32.16	2.71	26.66	3.14
T.	(U.23)	6	19.83	1.83	32.50	4.96	24.83	3.12
	(U.19)	10	21.90	3.07	28.60	3.83	24.50	2.36
Average Ability								
	(S)	10	21.20	1.98	30.00	5.31	26.30	2.62
T.F.	(U.23)	9	20.88	1.05	29.22	5.33	27.55	2.96
	(U.19)	11	20.81	2.60	29.72	3.84	25.81	3.70
	(S)	3	20.33	3.05	30.00	5.19	24.66	3.78
B.R.	(U.23)	5	17.40	3.64	30.20	3.03	26.60	3.04
	(U.19)	3	21.66	2.51	21.00	3.60	25.66	2.08
	(S)	2	23.50	0.70	25.00	1.41	26.50	0.70
H.B.	(U.23)	4	22.00	1.15	24.75	1.50	27.25	0.50
	(U.19)	3	21.33	3.21	34.33	5.13	25.00	3.00
	(S)	9	21.44	1.58	26.77	2.33	25.55	3.35
T.	(U.23)	6	21.66	1.50	29.83	6.46	27.33	2.16
	(U.19)	7	21.14	2.26	30.28	4.19	24.71	3.09

T.F.=Tight Five B.R.=Back Row H.B.=Half Backs T.=Threequarters

(b) On the dependent variables OIT, NAR and RED (n=144)

Group		OIT			NAR		RED	
		(n)	M.	S.D.	M.	S.D.	M.	S.D.
High Ability.								
	(S)	10	22.00	3.43	36.50	3.20	38.30	4.80
T.F.	(U.23)	11	21.72	2.57	34.18	2.78	37.00	2.86
	(U.19)	5	19.00	1.58	33.00	1.22	38.00	3.74
	(S)	4	20.50	4.43	37.00	0.81	40.00	4.16
B.R.	(U.23)	3	25.00	3.60	36.66	2.30	42.66	3.05
	(U.19)	6	22.66	3.14	36.00	1.89	43.50	7.39
	(S)	4	20.50	3.51	36.50	4.04	35.50	6.80
H.B.	(U.23)	4	23.25	6.65	33.25	3.50	36.40	8.06
	(U.19)	3	23.66	3.51	33.33	1.52	37.00	7.81
	(S)	6	25.00	3.09	34.66	3.44	40.33	4.36
T.	(U.23)	6	21.83	5.38	32.33	3.20	40.16	4.66
	(U.19)	10	21.10	5.52	35.20	3.20	38.50	4.11
Average Ability.								
	(S)	10	22.90	3.69	36.50	1.43	39.50	2.63
T.F.	(U.23)	9	28.33	4.35	35.22	6.01	44.77	4.46
	(U.19)	11	23.00	3.89	35.63	4.05	39.18	5.96
	(S)	3	21.66	2.88	37.00	1.00	38.66	4.72
B.R.	(U.23)	5	22.60	2.96	35.60	1.67	39.40	2.30
	(U.19)	3	17.33	2.51	33.66	0.51	35.00	8.00
	(S)	2	19.50	0.70	37.50	0.70	40.50	0.70
H.B.	(U.23)	4	20.75	0.57	32.50	1.29	31.75	3.50
	(U.19)	3	25.33	3.21	35.66	2.51	40.66	5.50
	(S)	9	20.77	2.04	35.22	3.99	39.88	1.53
T.	(U.23)	6	22.16	2.71	34.16	3.97	39.66	5.39
	(U.19)	7	23.00	5.65	33.28	2.69	39.85	4.45

T.F.=Tight Five B.R.=Back Row H.B.=Half Backs T.=Threequarters

Table 3: Summary of the Three-way Manova (Ability, Experience and Position) on the dependent variables. (n=144).

Source	F	df	p
Ability (A)	0.47	1,120	.827
Experience (E)	1.77	2,120	.054
Position (P)	1.59	3,120	.058
A x P	1.32	3,120	.102
A x E	0.78	2,120	.663
E x P	1.44	6,120	.048
A x P x E	1.40	6,120	.054

Table 4: Summary of the Two-way Manovas for ability and position played.

Source	F	df	p
Ability (A)	0.53	1,136	.784
Position (P)	1.74	3,136	.030
A x P	1.41	3,136	.119

CELL SAMPLE SIZE

		Position			
		T.F.	B.R.	H.B.	TH.
Ability	High	26	13	11	22
	Average	30	11	9	22

T.F.=Tight Five B.R.=Back Row H.B.=Half Backs TH.=Threequarters

Table 5: Summary of the Two-way Manovas for ability and experience.

Source	F	df	p
Ability (A)	0.98	1,138	.438
Experience (E)	1.57	2,138	.098
A x E	1.34	2,138	.193

CELL SAMPLE SIZE

		Experience		
		Senior	U.23	U.19
Ability	High	24	24	24
	Average	24	24	24

Table 6: Summary of the Manova for experience and position played (n=144).

Source	F	df	p
Experience (E)	1.80	2,132	.048
Position (P)	1.78	3,132	.025
E x P	1.28	6,132	.127

CELL SAMPLE SIZE

		Position			
		T.F.	B.R.	H.B.	TH.
	Senior	20	7	6	15
Experience	U.23	20	8	8	12
	U.19	16	9	6	17

T.F.=Tight Five B.R.=Back Row H.B.=Half Backs TH.=Threequarters

Research Question 1:

Does attentional style, as measured by the TAIS, differ between high and average ability rugby players ?

The means and standard deviations of the two ability groups on each dependent variable are presented in Table 7. The Two-way Manovas revealed no significant main effect or interaction for ability. Results from the present study conceptually replicate Van Schoyck and Grasha's (1981) and Vallerand's (1983) findings that the TAIS was not able to discriminate between performers of different ability levels. It was concluded rugby players of different ability levels did not differ on the attentional subscales of TAIS.

Based on Nideffer's theory of attention, the TAIS subscale scores were expected to change with increase in ability level. Scores on scales BET, BIT and NAR, all measuring positive aspects of attentional functioning, were expected to increase from average to high ability player. The opposite was expected for the scales associated with the inability to attend properly:- scales OET, OIT and RED.

In summary, besides lacking statistical significance in the capacity to differentiate among players of various abilities, several TAIS scales showed trends that were the opposite of those expected. Average ability players, for example, revealed higher cell means on the BIT and NAR subscales opposite to results expected; similarly, they scored lower on the OET subscale, a result inconsistent with Nideffer's theory.

Table 7: Means and Standard Deviations for the two levels of ability on each of the dependent variables.

Attentional Subscale	High Ability (n=72)		Average Ability (n=72)	
	M.	S.D.	M.	S.D.
Broad-external focus (BET).	21.12	2.76	21.00	2.49
Over-inclusive external focus (OET).	29.11	4.60	28.86	4.79
Broad-internal focus (BIT).	25.51	2.85	26.15	2.90
Over-inclusive internal focus (OIT).	22.01	4.02	22.86	4.18
Narrow-external and internal focus (NAR).	34.90	3.03	35.15	3.28
Under-inclusive external and internal focus (RED).	38.83	5.07	39.62	4.91

Research Question 2:

Is attentional style, as measured by the TAIS, related to the experience of rugby players ?

The means and standard deviations of the three different experience groups are presented in Table 8. The Two-way Manovas revealed a significant multivariate effect for experience ($F= 1.80$, $p<.05$) (See Table 6). Subsequent univariate analyses of variance of the main effect of experience indicated one significant dependent variable, NAR (See Table 9). Scheffe's test of multiple comparisons was applied to determine the exact nature of the group differences on the dependent variable. The senior group mean score on NAR differed significantly from both the U.23 group and the U.19 group ($p<.05$). Comparison between the U.23 group and the U.19 group did not reveal a significant difference. An examination of the three different experience group mean scores (See Table 8) was used to evaluate the direction of differences.

Results of the present study are consistent with both previously reported studies which have used the TAIS to examine the effect of experience on athletes. Richards and Landers (1979) and McKenna (1982) found that attentional differences did exist between experienced and less experienced athletes.

The differences on the dependent variable NAR, indicate that senior players describe themselves as being significantly more effective at narrowing attention than either the U.23 or U.19 group had described themselves. The senior group scored lower on the subscales OET, OIT and RED which indicate ineffective elements within the attentional style. This observation, combined with the result on

Table 8: Means and Standard Deviations for the three levels of experience, on each of the dependent variables.

Attentional Subscale	Senior (n=48)		U.23 (n=48)		U.19 (n=48)	
	M.	S.D.	M.	S.D.	M.	S.D.
BET	20.92	2.45	21.08	2.48	21.19	2.71
OET	28.46	4.43	29.29	5.04	29.21	4.60
BIT	25.54	2.78	26.48	2.83	25.48	2.98
OIT	21.96	3.35	23.38	4.39	21.98	4.41
NAR	36.15	2.85	34.23	3.67	34.71	2.94
RED	39.13	3.86	39.31	5.44	39.25	5.58

BET=Broad-external focus.
BIT=Broad-internal focus.
NAR=Narrow-external and internal focus.
OET=Over-inclusive external focus.
OIT=Over-inclusive internal focus.
RED=Under-inclusive external and internal focus.

Table 9: Summary of the One-way Anovas for experience, within the two factor design (experience and position) (n=144).

Source	F	p
Broad-external focus (BET)	0.22	.799
Over-inclusive external focus (OET)	0.94	.392
Broad-internal focus (BIT)	2.52	.084
Over-inclusive internal focus (OIT)	1.39	.252
Narrow-external and internal focus (NAR)	4.76	.010 *
Under-inclusive external and internal focus (RED).	0.14	.868

* $p<.05$

NAR, reveals that with experience, players describe themselves as being able to select the relevant cues from their environment and avoid an overload of stimuli.

It was concluded the TAIS attentional scales did have the capacity to discriminate between players of different experience levels. The lack of a control group of non-athletes made it impossible, however, to determine if these findings were due to increasing experience within the game, or merely to increasing age.

Research Question 3:

Do specific positional groups differ on attentional style, as measured by the TAIS ?

The means and standard deviations of each of the four positional groups are presented in Table 10. The Two-way Manovas revealed a significant main effect for position ($F = 1.78$, $p<.05$) (See Tables 4 and 6). The subsequent Anovas indicated two significant dependent variables, BET and RED (See Table 11). Scheffe's test of multiple comparisons was applied to determine the exact nature of the group differences on the dependent variables. The Scheffe test indicated that the Half Back group differed from each of the other three positional groups, on both of the significant dependent variables ($p<.05$). An examination of the positional group mean scores (See Table 10), was used to evaluate the direction of differences. These results indicate that these two TAIS attentional subscales are sufficiently sensitive to discriminate between Half Backs and the remaining three positional groups of rugby players.

Table 10: Means and Standard Deviations for the four different positional groups, on each of the dependent variables.

Attentional Subscale	T.F. (n=56)		B.R. (n=24)		H.B. (n=20)		TH. (n=44)	
	M.	S.D.	M.	S.D.	M.	S.D.	M.	S.D.
BET	20.75	2.16	20.46	3.33	22.55	2.09	21.11	2.47
OET	28.80	4.78	28.96	4.53	28.00	5.31	29.68	4.38
BIT	25.75	2.98	26.29	3.15	26.30	2.17	25.48	2.91
OIT	23.05	4.20	21.79	3.63	22.20	3.93	22.11	4.34
NAR	35.36	3.61	36.00	1.75	34.55	3.02	34.29	3.41
RED	39.45	4.80	40.29	5.56	36.45	6.01	39.64	3.91

T.F.=Tight Five B.R.=Back Row H.B.=Half Back TH.=Threequarter

BET=Broad-external focus.
BIT=Broad-internal focus.
NAR=Narrow-external and internal focus.
OET=Over-inclusive external focus.
OIT=Over-inclusive internal focus.
RED=Under-inclusive external and internal focus.

Table 11: Summary of the One-way Anovas for position, within the two factor design (experience and position).

Source	F	p
Broad-external focus (BET)	3.25	.024 *
Over-inclusive external focus (OET)	0.68	.564
Broad-internal focus (BIT)	0.35	.782
Over-inclusive internal focus (OIT)	0.61	.609
Narrow-external and internal focus (NAR)	1.99	.118
Under-inclusive external and internal focus (RED)	2.96	.045 *

$p<.05$

The group cell mean for Half Backs on BET was significantly higher than the Tight Five, Back Row and Threequarter groups. This result suggests that Half Backs describe themselves as being more effective at integrating many environmental stimuli at one time. The group mean score for Half Backs on RED was significantly lower than the remaining positional groups. Therefore, Half Backs see themselves as less likly to make mistakes because they have narrowed attention too much, and have failed to include all of the task-relevant information.

These results suggest that Half Backs, more than any other positional group, believe they have the ability to integrate more information, as well as to focus on the relevant stimuli, without discarding pertinent details. Both of these results are vital abilities for the 'decision makers' within a team. Examination of all positional cell mean scores reveals that Half Backs as a group, reflected most closely Nideffer's concept of an effective attentional style. They were highest on two of the three effective attentional behaviours, and lowest on two of the three ineffective types of attentional behaviour. Attentional style does not seem to be an important factor for Tight Five, Back Row or Threequarter players.

Research Question 4:

Do relationships between the attentional subscales of the TAIS, as responded to by rugby players, describe the main features of attentional style suggested by Nideffer ?

The correlations among the attentional subscales are presented in Table 12. Nideffer (1976c) suggests that the direction (internal to external) and bandwidth

(narrow to broad) dimensions describe the major features of attentional style. Therefore, certain intercorrelations among the subscales should occur if the two dimensions are at all present.

If direction of attention was adequately assessed by the TAIS, the subscales at opposite ends of this continuum should be negatively correlated (Van Schoyck and Grasha, 1981). Subscale combinations BET and BIT as well as OET and OIT should have been negatively correlated. An examination of Table 12 revealed that each of the two subscale combinations (BET, BIT)(OET,OIT) had a high positive correlation. The high common factor of 'broad' focus on scales BET and BIT, and the 'overload' of scales OET and OIT may account for the positive correlation. This indicated that the attentional dimension of direction (ie. internal to external) was not a strong component of these four subscales.

The comparison of the sets of paired scales BET/OET, BIT/OIT, and NAR/RED are suggested by Nideffer to reflect an individual's competencies along the bandwidth dimension. Scales BET and BIT both assess an effective broad focus, BET externally and BIT internally. Scales OET and OIT assess an ineffective broad focus, OET externally and OIT internally. Therefore a high score on BET, and a low score on OET suggest an effective broad external focus, whereas a low score on BET and a high score on OET indicates an ineffective broad external focus. The scales BIT and OIT should be similarly related, to indicate an effective or ineffective broad internal focus. Scales NAR and RED assess a narrow focus. High scores on NAR and low on RED suggest an effective narrow focus; low scores on NAR and high scores on RED, indicate an ineffective narrow focus.

Table 12: The TAIS inter-scale correlations (n=144).

	BET	OET	BIT	OIT	NAR
OET	-.16				
BIT	.31 *	-.10			
OIT	-.08	.59 *	.09		
NAR	-.11	.17	-.06	.02	
RED	-.22 *	.51 *	-.08	.52 *	.29 *

* $p<.01$

BET=Broad-external focus.
BIT=Broad-internal focus.
NAR=Narrow-external and internal focus.
OET=Over-inclusive external focus.
OIT=Over-inclusive internal focus.
RED=Under-inclusive external and internal focus.

The three sets of paired scales BET/OET, BIT/OIT and NAR/RED, if adequately assessing bandwidth of attention, should be negatively correlated. Only one of the three correlations BET/OET (-.16) was in fact negative, once again not adding strong support for a bipolar continuum.

The scales OIT, OET and RED revealed the highest positive interscale correlations (See Table 12). These three scales are designed to assess an athlete's ineffective attentional style, which may be the high common factor. Scales OIT and OET however, both measure an athlete's tendency to become overloaded with information, whereas scale RED assesses an athlete's predisposition to narrow attention too much. Therefore, OIT/RED and OET/RED would have been expected to reveal a negative correlation.

It was concluded, the interscale relationships indicated by the present study support the findings of Van Schoyck and Grasha (1981). The results did not support Nideffer's contention that the bandwidth and direction continuums are bipolar.

In summary, the results of the present study revealed no significant differences between the high and average ability levels investigated on the attentional subscales of the TAIS. Differences were found to exist between experienced and less experienced rugby players. It was noted, however, the lack of a control group of non-athletes made it impossible to determine if these findings were due to increasing experience within the game, or merely to increasing age. The Half Back group was found to differ from the remaining positional groups on the two dependent variables BET and RED. It was observed the Half Backs reflected most closely Nideffer's concept of an effective attentional style. Finally, the results of

the current research indicated that the two dimensions of attention postulated by Nideffer, do not seem to be bipolar in nature.

Chapter II

CONCLUSIONS.

Like all free-moving team games rugby is very complex and intuitively it would appear to have high attentional requirements. The purpose of this study was to determine if success in playing the game, experience within the game, and position played could be related to attentional style, as measured by the TAIS.

The results of this investigation indicate that rugby players of different ability levels do not appear to differ on the attentional subscales of the TAIS. Therefore, it was concluded, in agreement with the findings of Van Schoyck and Grasha (1981) and Vallerand (1983), that success (in this case attaining high ability status) is not related to attentional style.

The findings did reveal that "level of experience" is a variable on which the attentional subscales of the TAIS appear to discriminate between groups. Consistent with the observations of Richards and Landers (1979) and McKenna (1982), the conclusion reached was that attentional differences exist between experienced and less experienced rugby players.

It would seem to make good sense intuitively that there is a learning component within the attentional mechanism. With practice and training it is likely that players learn to attend to relevant cues. Being a cross-sectional study, no evidence exists within this research to demonstrate the change in athletes' attentional processes over time. Therefore, no definitive conclusion can be made as to the relationship between experience and attentional style.

Significant differences were also found between the Half Backs and the remaining positional groups (Tight Five, Back Row and Threequarters) on two of the six dependent variables (BET and RED). It was noted that the Half Backs reflected most closely Nideffer's concept of an effective attentional style, an important attribute for the decision makers within a team.

The current research did produce additional support for the notion that the concept of attentional style may be more complex than Nideffer's theory indicates. In accordance with the views of Etzel (1979), Van Schoyck and Grasha (1981), and Vallerand (1983) it was concluded that two bipolar dimensions, as expressed by Nideffer, may be a too simplistic conception of attentional theory.

Implications

The findings indicated more similarities than differences on attentional style, between the two levels of ability. This may have been caused by a lack of distinction between the ability levels of these groups, or the inability of the instrument to discriminate. To determine which of these two possibilities is correct, it is suggested that more distinct differences in the level of ability should be compared, such as international players versus club players. This may allow unequivocal conclusions to be reached.

While differences were observed among groups based on experience, it could not be concluded definitively that this was due to experience within the sport rather than increasing age. Use of a longitudinal study employing a control group

is recommended for future investigations. Such an approach would help to determine which of these two factors is related to attentional style.

The findings further revealed that with the exception of Half Backs attentional styles were found to be more similar than dissimilar across the positional groups. The Half Backs who were the most specialized of the four positional groupings addressed within this study, did differ on attentional style from Tight Five, Back Row and Threequarters. It is possible that the general nature of the groupings employed in the study masked any differences in attentional style. For future research it is recommended that players be grouped by specific position to address this concern.

The importance of an effective attentional style for Half Backs does indicate that each player's attentional strengths and weaknesses in these positions should be assessed. The necessary attentional strategies may then be employed to enhance performance where required.

It was further concluded from this study that the two bipolar dimensions, as expressed by Nideffer, may be a too simplistic conception of attentional theory. Vallerand (1983) argued that the TAIS may not be a good predictor of sport performance because it is based on an incomplete theoretical position. He cited the work of Van Schoyck and Grasha (1981), along with Landers, Furst and Daniels (1981), in concluding that attention should be viewed as a multidimensional construct. These researchers also suggested a more sport-specific instrument would have better predictive validity than the present TAIS, which refers to general life situations. It is recommended that the study should be repeated with an inventory which assesses rugby situations. This should have more relevance for rugby play-

ers, and thereby enhance the test's ability to determine individual attentional differences, improving it's predictive validity.

Finally a more eclectic approach which would integate the theory and research from the areas of perceptual style and information processing would be desirable. This type of approach has been initiated by Etzel (1979) who's model incorporates dimensions of capacity and duration with selectivity, flexibility and intensity from both areas. It is also suggested that the examination of the relationships between the more physical aspects of perceptual style such as proposed by Witkin (1962), and attentional style as proposed by Nideffer, might address some of the validity concerns expressed in this study.

The self-selected nature of the study sample, and the limitation on its number imposed by the size of the Vancouver Island representative rugby squads, did limit the research. For future investigations, a more sophisticated experimental design is recommended. A greater diversity of population, a larger sample and the use of control groups would likely provide more conclusive results.

The results in the present study are exploratory in nature. Further research is required to unravel the dimensions of attention in athletes and its relationships to the development of skill, positional roles and experience within various sports. A more direct focus on the underlying dimensionality and a move towards more sport-specific instruments in future investigations, should also lead to a more thorough understanding of attentional style in athletes.

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REFERENCE NOTE

1 Personal communication with Dr.B.L.Howe, Faculty of Education, University of Victoria. (Former Canadian National Rugby Coach, 1980-1984). February 21st 1986.

APPENDIX A

A BREAKDOWN OF THE ATTENTIONAL SUBSCALES OF THE TEST OF ATTENTIONAL AND INTERPERSONAL STYLE

Broad-External focus of attention (BET)

34 I am good at quickly analyzing complex situations around me, such as how a play is developing in football or which of four or five kids started a fight.

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

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

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

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

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

BET- Total items=6. Subscale Mean=14. Subscale Range=4-24.

Overload from external sources (OET)

1	When people talk to me I find myself distracted by the sights and sounds around me.
7	I run back and forth from task to task.
8	I seem to work in "fits and starts" or "bits and pieces."
11	The world seems to be a booming buzzing brilliant flash of color and confusion.
29	It is easy for me to keep sights and sounds from interfering with my thoughts. *
30	Happenings or objects grab my attention.
33	With so much goings on around me, it's difficult for me to think about anything for any length of time.
35	At stores I am faced with so many choices I can't make up my mind.
46	I get confused trying to watch activities such as a football game or circus where a number of things are happening at the same time.
56	People have to repeat things to me because I become disracted by irrelevant sights and sounds around me.
64	I get confused at busy intersections.
71	Sometimes lights and sounds come at me so rapidly they make me lightheaded or dizzy.

OET- Total items=12. Subscale Mean=17. Subscale Range=1-36.

Broad-internal focus of attention (BIT)

3	All I need is a little information and I can come up with a large number of ideas.
20	I theorize and philosophize.
24	My interests are broader than most people's.
27	It is easy for me to focus on a number of things at the same time.
34	I am good at quickly analyzing complex situations around me, such as how a play is developing in football or which of four or five kids started a fight.
51	In games I make mistakes because I am watching what one person does and forget about the others. *
52	I can plan several moves ahead in complicated games like bridge or chess.
70	It is easy for me to bring together ideas from a number of different areas.

BIT- Total items=8. Subscale Mean=18.5. Subscale Range=5-32.

Overload from internal sources (OIT)

2	When people talk to me I find myself distracted by my own thoughts and ideas.
10	My thoughts and associations come so rapidly I can't keep up with them.

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

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

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

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

69 I have a tendency to get involved in a conversation and forget inportant things like a pot on the stove, or like leaving the motor running on the car.

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

73 People pull the wool over my eyes because I fail to see when they are obviously kidding by looking at the way they are smiling or listening to their joking tone.

OIT- Total items=9. Subscale Mean=13.5. Subscale Range=1-27.

Narrow attentional focus (NAR)

4 My thoughts are limited to the objects and people in my immediate surroundings.

6 The work I do is focussed and narrow, proceeding in a logical fashion.

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

18 I think about one thing at a time.

25 My interests are narrower than most people's.

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

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

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

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

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

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

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

NAR- Total items=12. Subscale Mean=22. Subscale Range=3-41.

Reduced attentional focus (RED)

4 My thoughts are limited to the objects and people in my immediate surroundings.

5 I need to have all the information before I say or do anything.

6 The work I do is focussed and narrow, proceeding in a logical fashion.

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

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

18 I think about one thing at a time.

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

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

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

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

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

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

66 I get anxious and block out everything on tests.

69 I have a tendency to get involved in a conversation and forget important things like a pot on the stove, or like leaving the motor running on the car.

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

RED- Total items=15. Subscale Mean=25. Subscale Range=7-43.

*** Indicates that an item is scored in the reverse direction.**

APPENDIX B

COACH CONSENT FORM

Dear Coach,

First let me introduce myself. My name is Ian Maynard and I am at present studying towards a Masters Degree at the University of Victoria. At U.Vic I am a player/coach in the Rugby Club with special responsibility for the Jutes (Division 4).

A vital part of my academic course involves a research project. Under the supervision of Dr.Bruce Howe I hope to look into the effect of Attentional Styles on Rugby Players (for details please find an outline of my proposal enclosed). Very little research has ever been pursued in the game of Rugby and I am sure any such work can only be for the good of the game.

The testing procedure I hope to follow will create a minimum of disruption. The questionnaire takes only about thirty minutes to complete and can be filled out away from the game or training situation.

I have already consulted the Vancouver Island Rugby 'Representative' Committee and have gained their full cooperation via Mr Barclay Logan, and naturally hope to have your consent before approaching the players. Ofcourse participation in the study by the players is totally voluntary and anonymity in all results is assured.

I would be most grateful if written permission for me to contact the players (at sometime in the future, that both you and the team will find convenient), could be forwarded to me in the self addressed envelope enclosed. If any problems arise, please do not hesitate to contact Dr.Howe or myself here at U.Vic.

Thank you,

Ian Maynard

Dr Bruce Howe.

APPENDIX C

PLAYER CONSENT FORM

I am engaged in data collection for my masters thesis at the University of Victoria. At U.Vic I am a player/coach in the Rugby Club. Under the supervision of Dr.Bruce Howe, with your cooperation, I hope to look into the effect of Attentional Styles (the way we see the world around us) on Rugby Players.

To date there has been very little research completed within rugby and I am sure any such work can only be good for the game. Within other activities such as Soccer, Football and Golf it has been found that certain Attentional Styles suit best the demands of the different sports. I am interested to find if the same conclusions can be made within rugby, with reference to level of ability, age and position(s) played.

I propose to test the representative rugby 'squads' of Vancouver Island (The Crimson Tide) at 'Senior', 'U.23' and 'U.19' levels, and 'Club' players in the same age brackets. Both groups will be assessed with the Test of Attentional and Interpersonal Style (TAIS), which is a quick and easy questionnaire.

Before making my approach to you, I have consulted, and have the full cooperation of Vancouver Island Rugby Union Executive as well as the unanimous support of the 'Tide' and your club coaching staff. At this stage I should like to make it quite plain that you're cooperation is totally voluntary, and although I need your

personal details to process the data, your anonymity will be assured in all results gathered in this research project. I have included a statement to this effect which I would be grateful if you will sign, giving me your consent to use the results.

Both Dr.Howe and myself hope you will take the short time required to fill out this questionnaire and return it in the self-addressed envelope. Your cooperation will be most appreciated.

Thank you,

Ian Maynard

Dr. Bruce Howe

I have read the above and agree to complete the enclosed questionnaire. I realize that my cooperation is totally voluntary and understand I am assured of anonymity in all results.

NAME; ---------- **DATE;** ----------

(Block capitals please)

SIGNATURE; ----------

VITA

Surname: MAYNARD **Given Names:** Ian William

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Educational Institutions Attended, with Dates of Entering and Leaving:

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		to	
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ATTENTIONAL STYLES IN RUGBY PLAYERS

Author 

IAN W.MAYNARD

August 28th 1986