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Attentional style of soccer athletes

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ATTENTIONAL STYLE OF SOCCER ATHLETES

by

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An Abstract

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ABSTRACT

A test of soccer attentional style (TSAS) was designed, based upon six attentional constructs utilised by Nideffer in the Test of Attentional and Interpersonal Style (TAIS). Both tests were administered, together with a personal assessment questionnaire (PAQ) for self-report measures of ability, success, and experience in soccer. The data from the TSAS and the TAIS were collected to compare and contrast the attentional style of high and low ability, successful and less successful, and experienced and less experienced soccer athletes. The subjects involved in the study were 104 varsity and junior varsity soccer athletes from eight educational institutions in New York State during the spring of 1979. To gain measures of test-retest reliability, 23 subjects were readministered the testing instruments following a 3-5 week interval. The range of life situations in the TAIS had been used in a semi-trait approach to assess the attentional style of individuals and hence predict their behaviour in a variety of specific environments. The TSAS contained soccer specific situations following Nideffer's suggestion that test situations be as specific as possible if behaviour is to be examined in a particular setting. It was hypothesised in this study that the TSAS would differentiate the ability, success, and experience levels of soccer athletes, while the TAIS would not. The attentional items of the TAIS and the 78 statements of the TSAS represented one of six types of attention. These were a broad external focus (BET), a broad internal focus (BIT), a narrow effective focus (NAR), an overloaded external focus (OET), an overloaded internal focus (OIT), and an underinclusive focus (RED).

Subjects responded to each of the situations according to the frequency of occurrence on a 5-point continuum from "never" to "always." The test-retest reliability coefficients for the TAIS scales ranged from .73 to .36, while the TSAS scales ranged from .92 to .81. The PAQ test-retest coefficient for ability was .72 and .86 for the success scores. Coefficient alpha reliability for the TAIS scales ranged from .70 to .27, while the TSAS scales ranged from .83 to .67. Subjects were ranked according to their ability, success, and experience scores on the PAQ. Approximately the top and bottom third were classified as high and low ability, successful and less successful, and experienced and less experienced respectively. Multivariate analyses of variance revealed significant ($p < .01$) differences between high and low ability groups and between successful and less successful groups with both the TAIS and the TSAS. No significant difference ($p > .05$) was reported between the experienced and less experienced groups on the TAIS and the TSAS. It was reported from discriminant function analyses that the BET scale for both the TAIS and the TSAS was a major contributor to the ability and success groups differences. Analyses of variance revealed that each of the six TSAS scales differentiated high and low ability and successful and less successful groups ($p < .05$), while only the BET and BIT scales of the TAIS were able to differentiate ability and success groups. It was concluded that both the TAIS and the TSAS attentional scales were capable of differentiating both high and low ability and successful and less successful soccer athletes, as determined from the PAQ.

ATTENTIONAL STYLE OF SOCCER ATHLETES

A Thesis Presented to the Faculty of
the School of Health, Physical
Education, and Recreation
Ithaca College

In Partial Fulfillment of the
Requirements for the Degree
Master of Science

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by
Adrian Haffner Taylor
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Ithaca College
School of Health, Physical Education and Recreation
Ithaca, New York

CERTIFICATE OF APPROVAL

MASTER OF SCIENCE THESIS

This is to certify that the Master of Science Thesis of

Adrian Haffner Taylor

submitted in partial fulfillment of the requirements for the degree of Master of Science in the School of Health, Physical Education, and Recreation at Ithaca College has been approved.

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Chapter 1

INTRODUCTION

The ability to search for, select, and maintain a focus on the most relevant cues for the task in hand appears to be of vital importance in the performance of almost any physical activity or sport. Cratty (1973), Gallwey (1974), Herrigel (1964), Nideffer (1971, 1978) and Wiren and Coop (1978) have all categorised the superior sports performers as those with an appropriate type of attention in the environment in which they demonstrate their skills. Further, if the individual chooses or inadvertently focuses on irrelevant cues for the task at hand, then it would seem likely that performance would deteriorate.

The importance of attention both as a field of research and in behavioural diagnoses has been confirmed by the range and volume of attentional literature, particularly in the past 3 decades. However, a simplistic research methodology has failed to illustrate any easily comprehensible empirical relationship between attentional ability and behaviour. Attentional abilities, like other psychological variables, have been regarded as traits, such that performance on a laboratory test designed to measure a type of attention can be used to infer attentional performance and behaviour in other situations as sport.

As psychology moves away from the increasingly unpopular trait paradigm and its assessment procedures, sport psychologists have also followed and adopted new approaches in an attempt to identify and explain behaviour in terms of the psychological variables that are inherent in

sports situations. Improved predictive validity and a greater understanding of the relationship between psychological variables and performance are notable claims to favour this new methodology (Rushall, 1975).

Many psychological variables have been examined in sport, though little research has been directed towards attentional processes and capabilities with the use of contemporary procedures. Indeed, Nideffer (1976b) has been alone in the assessment of attention in specific situations, while others continue to define attention as a personality trait with insufficient concern for the other situational variables, such as anxiety and arousal, that may affect behaviour. The need for instruments with operationally defined constructs (and yet founded on sound theoretical or conceptual bases) related to behaviour in particular settings would appear to be of major concern. With this in mind, psychological variables other than attention have been operationally defined in the sports situation. Such instruments as the S-R inventory of anxiousness have been designed using situations found specifically in football or other sports (Burton, 1977; Czarnecki, 1977; Horsfall, 1975).

Nideffer (1976b) recognises the need for assessment devices to be as situation specific as possible if a psychological variable and behaviour are to be examined in a particular setting. However he has developed an instrument, the Test of Attentional and Interpersonal Style (TAIS), which largely overlooks such a requirement. He states that "although this is important, we must also be able to generalize lest we end up measuring literally thousands of behavioural competencies that individuals must have to function effectively in complex job or life situations" (Nideffer, 1976b, p. 394). Fifty-two of the items on the TAIS reflect attentional

competencies in a variety of life situations. We may therefore expect that this test will be a valuable instrument in determining the general attentional abilities or style of an individual in the situations presented or those closely related. However, Nideffer (1976b) claims that the test holds predictive validity for behaviour in specific situations or activities such as student's interview behaviour and athletic (swimming) performance under pressure. This raises the question of how specific situations must be to gain an adequate assessment of behaviour in certain environments. Are generalisable attentional competencies in a variety of common life situations also reflected in any specific clusters of situations, such as the sports environment?

The development of the operationally defined attentional constructs employed by the TAIS rests upon theoretical or conceptual bases, established with research using traditional assessment techniques. While such techniques have contributed little towards the prediction and understanding of attentional behaviour in extralaboratory situations, a recognition of the various attentional dimensions exhibited in human behaviour has been of considerable benefit.

Nideffer (1976b) has recognised the importance of two dimensions of attention. The width dimension refers to a continuum along which attentional focus may vary from broad to narrow, while the directional dimension considers an internal (feelings and thoughts) and external (environmental) focus. The two are seen as independent though coexisting, thus an individual's attentional focus may be described along both dimensions as either broad external, broad internal, narrow external, or narrow internal in any particular situation. Traditional research

techniques have attempted to relate these dimensions independently to performance without considering the individual's ability to control and shift attentional focus. This would seem important when the attentional demands within one activity may change rapidly as new situations continuously arise. Nideffer proposes that the four types of attention defined by width and directional dimensions may involve either an effective or ineffective attentional focus. For example, a broad external focus may be effective in one situation but ineffective in another.

While physical changes in the environment demand appropriate control of attention, an individual's perception may add meaning to a situation. The relationship between anxiety and attention has been well documented (Kahneman, 1973; Landers, 1978). It would seem that the ability to maintain or develop a broad attentional focus in an anxiety-inducing situation is reduced. Similarly there is a tendency to become internally focused. Anxiety is therefore to be recognised as an important variable when considering the assessment of attentional behaviour. Because attentional competencies are directly affected by an individual's level of anxiety in any given situation, an assessment device should be designed to consider this. Anxiety-inducing life situations of various potential levels have been incorporated in the TAIS attentional items to determine the ability of an individual to control attentional focus in those situations. For example, a person may have an effective external focus in one situation but may perceive another similar situation as anxiety inducing. This may result in loss of control and a narrowing of attentional focus causing errors of underinclusion in that situation.

The first half of the TAIS is comprised of life situations relating

to one of three effective or ineffective attentional scales. The effective scales involve a broad external focus, a broad internal focus, and a narrow focus, while the ineffective scales include an overloaded external focus, an overloaded internal focus, and an underinclusive focus. The TAIS is a self-report assessment device, requiring subjects to indicate the extent to which they manifest the behaviour described in each situation, along a 5-point Likert scale ranging from "never" to "always."

Scores on each of the six attentional scales have been used by Nideffer (1976a) to form a composite picture of the relative strengths and weaknesses of a person's attentional functioning. By defining the principal attentional requirements of various activities and occupations he claims to be able to predict how successful a person with a particular style of attentional focus will be. This of course assumes that the attentional style derived from the general life-situations of the TAIS will also be present in those activities and occupations for which the prediction is to be made, thus following a semi-trait approach.

Nideffer (1976b) recommends that assessment of attentional behaviour should be from situations as specific as possible to the environment in which a prediction or analysis of performance is to be made. The nature of this thesis, therefore, is in part to construct an assessment tool that examines the attentional style of soccer players, while employing situations specific to competitive soccer.

Many attempts have been made to assess ability in sport, including various skill tests, subjective observation, and self-report techniques. The large number of subjects from diffuse locations required for this

study made skill tests and observation techniques impractical and a self-report instrument was considered appropriate to gain measures of ability and also success in soccer. While levels of success and ability may well be a function of the involvement in a sport, a measure of experience may possibly point to this as an important mediator.

Coulson and Cobb (1979) have constructed a generalised expectancy of sport success scale to gain self-report measures of how successful athletes expect to be in sport generally. This study requires the construction of a similar test, to gain self-report measures of how successful an athlete has been in soccer and also a personal assessment of the individual's ability in soccer. A measure of experience may be gained from a straightforward question relating to the number of years the athlete has been participating in soccer.

The capacities of the Test of Attentional and Interpersonal Style and a test of soccer attentional style to relate the attentional style of soccer athletes to measures of ability, success, and experience in soccer, from a personal assessment questionnaire, will be compared and contrasted in this thesis.

Scope of Problem

A test of soccer attentional style (TSAS) was constructed with reference to part of Nideffer's Test of Attentional and Interpersonal Style (TAIS). Both tests were administered to 104 intercollegiate varsity and junior varsity soccer athletes at eight educational institutions in New York State during the spring semester of 1979. A personal assessment questionnaire (PAQ) was designed and also administered to gain self-report measures of ability, success, and experience in

competitive soccer.

The first 74 statements of the TAIS, relating to attentional style in a range of life situations, were employed, while the TSAS consisted of 78 randomly ordered statements relating specifically to situations encountered in competitive soccer. An initial pool of 110 situations describing an individual's functioning in soccer was reduced with the assistance of several soccer coaches and players. This was done on the basis of which situations seemed most tangible to the soccer athlete either through direct or vicarious experience and yet covering a range of situations over the whole spectrum of the game (other than goalkeeping) while avoiding unnecessary overlap of situations.

While between 6 and 15 of the TAIS situations represented one of Nideffer's six attentional scales, the TSAS consisted of 13 items related to the broad external focus, 13 to the overloaded external focus, 12 to the broad internal focus, 14 to the overloaded internal focus, 11 to the narrow effective focus, and 15 to the underinclusive focus.

Subjects rated items for the frequency of their occurrence on a 5-point continuum ranging from "never" to "always" using markread computer cards to record their answers. The PAQ employed a semantic differential technique with a 5-point scale. Subjects were required to respond to the statement "in soccer I have been," on six bipolar adjective scales describing success, and to "my soccer ability is," on nine bipolar adjective scales. Space was also provided on this form to record the number of years of involvement in competitive soccer.

The data gathered from all three tests were computed to examine the effects of level of ability, success, and experience in soccer, on the

TAIS and TSAS scores on each of the six scales of attention. Twenty-three of the Ithaca College subjects were administered all three tests on a second occasion 3-5 weeks later to gain a measure of reliability.

Statement of Problem

The present study involved the development of a test of soccer attentional style (TSAS) which related to situations specifically encountered in competitive soccer. The situations attempted to encompass the attentional variables and dimensions found in the Test of Attentional and Interpersonal Style (TAIS) relating to general life situations. A personal assessment questionnaire (PAQ) was also devised in an attempt to gain self-report measures of perceived ability, success, and experience in soccer. The data from the TSAS, the TAIS, and the PAQ were computed in an attempt to answer the following questions:

1. To what extent is the attentional style of soccer athletes, as measured by the TSAS, a function of ability, success, and experience in the sport of soccer?

2. Is the attentional style of soccer athletes, as measured by the TAIS, a function of ability, success, and experience in the sport of soccer?

Hypotheses

1. There will be a significant difference between the scores on the TSAS attentional scales of soccer athletes who regard themselves to be of high ability and those of low ability.

2. There will be no significant difference between the scores on the TAIS attentional scales of soccer athletes who regard themselves to be of high ability and those of low ability.

3. There will be a significant difference between the scores on the TSAS attentional scales of soccer athletes who regard themselves as successful and those who do not.

4. There will be no significant difference between the scores on the TAIS attentional scales of soccer athletes who regard themselves as successful and those who do not.

5. There will be a significant difference between the scores on the TSAS attentional scales of soccer athletes who have considerable experience and those who have participated for only a few years.

6. There will be no significant difference between the scores on the TAIS attentional scales of soccer athletes who have considerable experience and those who have participated for only a few years.

Assumptions of Study

1. The athletes were able to relate to the situations as presented, either through direct or vicarious experience.

2. The subjects were able to relate to the modes of response as presented.

3. Each situation held little or no ambiguity and surplus meaning for the athletes.

Definition of Terms

1. Attention: the mental process of selectively or broadly focusing on internal (thoughts and feelings) or external (environmental) stimuli.

2. Attentional style: the composite attentional strengths and weaknesses of an individual along the attentional dimensions of width and direction.

3. Effective attention: when the individual's focus fits the attentional demands in a particular situation.

4. Ineffective attention: when the individual's attentional focus is inappropriate in a particular situation.

5. Width dimension of attention: this refers to how much information and how broad a perceptual field an individual controls.

6. Directional dimension of attention: this refers to whether the focus of attention is directed internally or externally.

7. Broad external focus of attention: an effective type of attention in which the individual's focus is on a range of environmental cues.

8. Overloaded external focus of attention: an ineffective type of attention in which the individual's focus is on a range of environmental cues.

9. Broad internal focus of attention: an effective type of attention in which the individual's focus is on a range of cognitive and proprioceptive stimuli.

10. Overloaded internal focus of attention: an ineffective type of attention in which the individual's focus is on a range of cognitive and proprioceptive stimuli.

11. Narrow focus of attention: an effective type of attention in which the individual's focus is directed towards selective internal or external cues.

12. Underinclusive focus of attention: an ineffective type of attention in which the individual's focus is directed towards selective internal or external cues.

13. Soccer athlete: a member of the male varsity or junior varsity

soccer team at the New York State colleges and universities that participated in the present study.

14. Successful soccer athlete: an individual who reports that whilst playing competitive soccer he has been "on winning teams," "recognised," "successful," "rewarded," "happy," and "confident" to some degree.

15. Unsuccessful soccer athlete: an individual who reports that whilst playing competitive soccer he has been "on losing teams," "unnoticed," "unsuccessful," "frustrated," "sad," and "uncertain" to some degree.

16. High ability soccer athlete: an individual who reports that as a soccer player his ability is "above average," "good," "praised by coach," "superior," "broad," "praised by others," "encouraging," "strong," and "better than most" to some degree.

17. Low ability soccer athlete: an individual who reports that as a soccer player his ability is "below average," "bad," "ridiculed by coach," "inferior," "limited," "ridiculed by others," "frustrating," "weak," and "worse than most" to some degree.

18. Experience: the total number of years that the athlete has been involved in competitive soccer, including high school, summer leagues, and college level.

Delimitations of Study

1. The study involved only college males with varsity or junior varsity soccer experience.

2. Attentional styles were assessed with the use of Nideffer's Test of Attentional and Interpersonal Style (in part) and the

investigator's test of soccer attentional style.

Limitations of Study

1. Self-observation and observation of behaviour techniques of data collection were not used. The results of the present study cannot, therefore, be compared to results obtained using such techniques.

2. The results can only be generalised to soccer athletes who are considered similar to the subjects used in this study.

3. Attention was only assessed along the dimensions of width and direction of focus by the TAIS and the TSAS.

Chapter 2

REVIEW OF RELATED LITERATURE

This chapter presents a review of literature in the area of attentional processes, particularly in terms of the dimensions of width and direction within the concept of attentional styles, and their relationship to athletic ability. The first section reviews the concept of attentional styles, its origins, and relationship to performance generally. The second section examines the evidence concerning the interaction between attention and anxiety. The third section of this chapter reviews the attempts to relate attentional abilities to sport performance, with particular reference to the game of soccer. The final part of this chapter summarises the preceding sections.

Attentional Style

The ability to locate and focus on the cues and information most relevant for the task in hand would appear to be fundamental in the performance of almost any physical activity or sport. It is hardly surprising then that a myriad of literature has been devoted to the study of attentional processes and human behaviour (Berlyne, 1969; Murray, 1974). Nideffer (1976b) recognised the important role that attentional processes play in determining how individuals respond to their environments. In addition he noted that effective deployment of attention has been found to be a critical variable in a variety of performance and decision making situations. However the range and volume of literature and research has brought confusion and ambiguity to attention and many associated terms, including attentional style.

A primary distinction must be made between physical attentional processes and psychological or cognitive attentional functions. Physical processes of attention would involve such concepts as visual acuity (the span of foveal and peripheral vision) and an aspect of scanning concerned with changes in focus and searching for additional data (Wachtel, 1967). Psychological attention however is concerned with cognitive control processes and it is here that attentional style will have relevance in this study.

The term cognitive style is described as a broad recognition of a characteristic self-consistent way of functioning shown by the person in the cognitive sphere (Witkin, 1962). Many cognitive styles have been identified, often overlapping of which attentional style is a recent addition, many of its dimensions being drawn from contemporary cognitive control principles. Gardner, Jackson, and Messick (1960) suggested that cognitive control principles are ego structures which are essential attributes of personality organisation and control certain aspects of adaptive behaviour. They are thought to guide the expression of drive in response to particular classes of adaptive requirements and are therefore explained by the adaptive problems the individual encountered. These principles of cognitive organisation have been used to account for individual consistencies in response to a wide variety of test situations (Gardner, Holzman, Klein, Linton, & Spence, 1959). They further stressed that cognitive controls are enduring patterns, strategies, or programmes of cognitive behaviour. In the psychoanalytic ego psychological framework in which they were conceived controls were viewed as enduring cognitive structures.

Silverman (1964) stated, "these organisational tendencies vary from person to person and reflect typical strategies of coordinating private perception and conceptual experiences with those of the real world" (p. 354). An individual's cognitive style is reflected by one's organisational tendencies.

It would seem that cognitive controls would therefore suggest a trait conception but Gardner et al. (1959) were eager to dispel this notion. They noted that the generality refers to the range of situations that pose similar adaptive requirements and similar situational characteristics. As an example they suggested that a control principle like scanning represented the way a person may typically cope with circumstances which allow him the option of deploying attention to any preferred degree. In other words, scanning may only occur in situations that promote such attentional behaviour and therefore a control principle is influenced by the environment to some degree unlike typical trait constructs.

Attentional behaviour as an attentional style has its foundations within numerous cognitive control principles and Gardner et al. (1959) listed some of them. For example the control principle, scanning (which replaced Schlesinger's (1954) principle of focusing), implies a distinctive patterning of attention. Gardner and Long (1962) noted that extensive scanning reflects deployment of attention over widespread segments of a stimulus field, while selective scanning concerns attention to individual segments of a stimulus field. The control principle of field articulation (which represented a composite of a constricted-flexible control (Klein, 1954) and field dependence-

independence principles (Witkin, Lewis, Hertzman, Machover, Meissner, & Wapner, 1954) according to Silverman (1964) lends a pattern of attention deployment in which attention is directed towards the most relevant segments of an informational field. Finally the leveling-sharpening control principle raises the problem of attention availability and Gardner et al. (1959) suggested that levelers have a rather limited capacity for concentration.

Further cognitive controls which the literature suggests have relevance to attentional behaviour include such dimensions as Petrie's augmenting-reducing concept (Petrie, Collins, & Soloman, 1960), Eysenck's introversion-extroversion concept (Eysenck, 1959; Voth, 1962) and locus of control (Rotter, 1966). Petrie's and Eysenck's constructs have been described as related (Ryan, 1976). Augmenters and introverts are able to concentrate on their perceived amount of stimulation, while reducers and extraverts are unable to concentrate for extended periods, finding a need to gain extra simulation from the environment. Rotter (1966) suggested that internals are more likely than externals to perceive events as being contingent on their own behaviour and therefore direct their attention inward.

While individual control principles were tested against certain behavioural groups and across various situations with little success, it was suggested that members of clusters of such control principles, forming certain cognitive styles, should be more homogeneous in their reactions to certain extralaboratory situations than subjects grouped on the basis of single control principles (Gardner et al., 1959). An individual's style of adaptation, or one's mode of coming to terms with

the world, may therefore be conceived of as patterning or arrangement of that person's function along several dimensions of cognitive control.

We have as yet been concerned with the construct of cognitive style and the various cognitive control principles available, particularly those relating to attentional processes. Before advancing to the term attentional style, some ambiguity exists in the literature which requires clarification. The concept of perceptual style has frequently been used synonymously with cognitive style and less so only recently with attentional style. Indeed the literature has used such cognitive control principles as Witkin's field dependency to represent control dimensions for cognitive style and perceptual style (Schimek & Wachtel, 1969; Williams, 1975). It would seem from the literature that cognitive styles may draw upon dimensions from any area in the broad field of cognitive processes, while perceptual styles draw only from those dimensions and control principles concerned more specifically with perceptual processes. In reference to and use of attentional dimensions, the term perceptual style has largely replaced the broader cognitive style, and is still frequently used despite the emergence of a more appropriate and definite term, attentional style.

The formulation and inference of the term attentional style has been made by several researchers, consolidating different groups of the above control principles, thus suggesting considerable variation in the operational definition of the construct.

Silverman (1964) discussed the attentional style of schizophrenics in terms of the scanning and field articulation control processes. The scanning control relates to the extensiveness with which stimuli are

sampled when attending to a sensory or perceptual field, and the field articulation control depicts attention to certain segments of complex stimulus fields and stimulus inhibition of attention to other segments of these fields.

Wachtel (1967) considered an attentional style in terms of breadth of focus. He chose to equate the width dimension with Schlesinger's (1954) principle. The former refers to the degree to which individuals can integrate the objects of attentional focus and use them simultaneously to weave together a more complete and balanced picture of their inner and outer world (Wachtel, 1967, p. 419). The latter refers to a physical exploratory scanning process according to Wachtel and was therefore not considered an important cognitive control. Wachtel also suggested that a description of an individual's style of attention as either broad or narrow without distinguishing between different dimensions of breadth may be incomplete and confusing. The importance of direction of attention was also briefly discussed in agreement with Gardner et al. (1959) and Holzman and Gardner (1959). Focusing is "not only upon external stimuli but upon internal processes as well" (Wachtel, 1967, pp. 418-419).

Denney (1974) defined a child's attentional style as the ability to deploy attention selectively thereby avoiding distraction from intrusive and irrelevant stimulus information. This was derived from the earlier constricted-flexibility control dimension, along which a more flexible person would be less distracted by irrelevant stimuli. Although the results suggested a relationship between flexibility and reading ability, one can question the generalisability of a person's

score along this single dimension and the corresponding attentional style to other situations.

While Denney (1974), Silverman (1964), and Wachtel (1967) used combinations of various control principles to formulate breadth dimensions of attentional style, others recognised the directional dimension, internal-external, as a source of inter- and intra-individual differences in attentional style, though the broader term perceptual style is used.

Pelletier (1974) recognised several perceptual styles and then noted their attentional characteristics. He suggested that ego-close and field dependent individuals tend to invest attention in the immediate external environment and are particularly receptive to external stimuli, while ego-distant and field independent individuals tend to be detached from the external environment and are more aware of internal stimuli than external stimuli. A treatment of transcendental meditation was found to move ego-close and field dependents towards ego-distant and field independent styles. It was, therefore, inferred that transcendental meditation had the effect of altering the "attentional style" of individuals from an external to an internal predominant focus.

Heilbrun (1971, 1972) related a socio-perceptual style in individuals to an inferred "attentional style." The latter was discussed in terms of breadth of scanning behaviour. His earlier study, using schizophrenic subjects, found a relationship between perceptual style (open and closed-style) and breadth of external scanning behaviour. In 1972, with a similar sample, a relationship was also found with internal scanning behaviour. From these results Heilbrun (1972) inferred "attentional

styles" for each of his perceptual style types. He argued that the sheer economy of attention deployment would suggest that a perceptual style that oriented the person's attention toward external cues would detract from internal scanning to some extent. Therefore the open-style male would tend to be a narrow internal scanner, and conversely he suggested that the closed-style male, whose perceptual style reduces the breadth of his attention to external cues, should demonstrate broader internal scanning.

Nideffer (1976b) was the first to recognise attentional style in terms of both a breadth of focus dimension and a direction of focus dimension, coexisting and yet independent. Harris (1979) suggests that the two dimensions are only new labels for such cognitive control principles used earlier to formulate perceptual styles. However Nideffer (1976b, 1979b) refutes such claims, disassociating his own attentional dimensions from the contemporary control principles and dimensions used to formulate cognitive and perceptual styles. He suggests that such control principles are far broader than his own attentional dimension, usually encompassing many elements other than attentional which all add ambiguity to their usage. Further, it is noted that these measures often collapse cognitive style and personality characteristics into two, three and occasionally four categories (Nideffer, 1979b).

Nideffer's (1976b) call for unambiguous constructs can be substantiated from the literature discussed here and elsewhere. A prime example involves the field dependent-independent dimension, measured by such tests as the body-adjustment test, the rod-and-frame test, and the embedded-figures

test (Witkin, 1962); Pelletier (1974) recognised that field dependents are more externally focused than field independents. Silverman (1964) discussed field articulation (derived from field dependency) in terms of a selective attentional dimension. Bloomberg (1965) related field dependency to susceptibility to distraction. While a wide range of attentional abilities seems to be characteristic of the field dependence dimension, Witkin (1962) noted that the same essential kinds of individual differences in mode of perceptual functioning described for the body-adjustment, rod-and-frame, and embedded-figures test had also been observed in classical perceptual situations, such as illusions (Gardner, 1961), reversible perspective and analytic ability. Jackson (1971) contended that because such a scale or dimension included so many elements it was difficult to make reliable predictions of a person's behaviour from them. In addition, Nideffer (1976b) acknowledged how critical it is for personality and attentional factors to be separated and measured independently and recognized that a "requirement for a test's predictive utility is that the variables it presumes to measure be directly and unambiguously translated to particular interpersonal or environmental situations" (p. 395).

Nideffer (1976b) raised a second major criticism of contemporary attentional assessment devices, namely the problem of situation specificity and the trait concept. The literature contains considerable research employing a trait approach which has made similar assumptions. It has been noted by inference that since deployment of attention is the critical factor in determining performance on perceptual tasks, such as those used to indicate field dependence, any observed differences in

such a performance can be attributed to an alteration in the individual's style of attentional deployment or inter-individual differences. McClelland (1973) strongly questioned the validity of such inferences across a variety of life situations, while Mischel (1968) also claimed that trait concepts have failed to provide much predictive validity. It would appear that an alternative approach would be a situational analysis that can help to locate generalisable competencies, according to McClelland. Nideffer (1976b) suggested that we should be able to look at a situation and assess the strength of its demand for a particular attentional process or ability. Wallace (1966) referred to this as assessing the behavioural competency of the individual in particular situations. It would therefore appear that the attentional competency of the individual in a variety of situations could be evaluated by designing an assessment device with questions phrased to reflect actual behaviour in particular settings. Nideffer (1977a) claims that his Test of Attentional and Interpersonal Style does this. In the first part of this test a wide variety of life situations have been selected to reflect generalisable attentional competencies, while the second part is comprised of situations reflecting interpersonal behaviour and is of little concern here.

Generalisable attentional competencies are discussed in terms of the two dimensions, breadth of focus and direction of focus. Nideffer (1976b) suggests that at any single time, attention can be described on the basis of both its width and direction and stated that, "conceptually, it is relatively simple to apply the attentional dimensions of width and direction to specific environmental situations" (p. 396).

However, as situations change, he suggests attentional competencies, such as controlling width and direction, should change adaptively as a function of specific environmental demands.

Attention and Performance

The large volume of literature concerned with attentional constructs designed to explain phenomena ranging from schizophrenia (Shakow, 1962) to sport performance would seem to support the assertion that "it is hard to imagine a variable more central to performance than the ability to direct and control one's attention" (Nideffer, 1976b, p. 395). It is also from research in this field that the conceptualisation of attentional dimensions has largely emerged. The development of the constructs breadth and direction of attention has been discussed although the relationship to performance requires further elaboration.

The division of attentional studies into those involving normal and subnormal populations is an important one. We may perhaps expect subnormal human groups, by their very definition, to exhibit extreme characteristics along any physical or psychological dimension. DePalma and Nideffer (1977) noted that attentional deficits have been proposed for psychiatric groups, primarily schizophrenics, on the basis of both experimental and clinical data. The recognition of such deficits may be important if we are to operationally define the extreme behavioural characteristics along each attentional dimension.

Much of the schizophrenic research concerned with attentional behaviour has considered the breadth dimension. Broen (1966), Gardner et al. (1959), and Silverman (1964) all noted that schizophrenics tend to be extreme on measures of the controls of scanning and field

articulation in ways consistent with the kind of schizophrenia they exhibit. Further, paranoid schizophrenics tend to show extensive scanning and high field articulation, whereas simple schizophrenics evidence extremely minimal scanning and an undifferentiated style of attention consistent with minimal field articulation. However, confusion exists here as Broen (1966) and Wachtel (1967) both pointed out. Extensive scanning would suggest an overinclusive focus of attention while high field articulation suggests an undesirably narrow range of stimulus intake. Wachtel provides an explanation. He suggested that, by broadly scanning, paranoid schizophrenics are able to gather sufficient evidence for their ideas. Then by narrowly selecting what they find consistent with their delusional ideas, screening out and ignoring all other aspects of potential percepts, they use their extreme field articulation to ensure that the evidence indeed fits. In other words, two separate attentional inabilities are recognised, namely an extremely broad focus, referred to as an overinclusive concept by Broen (1966) and also an extremely narrow focus, referred to as a withdrawn concept by Cromwell (1968). However Cromwell saw these two processes in operation not within the same person, as Wachtel had suggested, but on a continuum from the overinclusive patient, "a good premorbid paranoid acute schizophrenic," to the "poor premorbid non paranoid acute schizophrenic" (Cromwell, 1968, p. 367). The latter, he noted, may be observed to either focus on only a simple external object, or no object at all, for long periods of time. They may also filter (or block out) their own thought process by which to construe what little stimulus input they receive (Cromwell, 1968). Interestingly there was

no mention of an independent directional dimension by Cromwell. The former types accept extensive external stimulus input and also exercise their thought processes extensively, while the "withdrawn" types have a "high base line redundancy level" (Cromwell, 1968, p. 367) or narrow focus of attention for both external and internal stimulation.

Once again much of the attentional research on subnormal groups carries severe limitations in that measurement of broad cognitive or perceptual dimensions has taken place and inferences have then been made regarding the specific attentional characteristics of such groups. However, despite the limited predictive validity, such research has been useful in the development of theoretical attentional constructs available for assessing attentional competencies and inabilities in a broader range of situations.

Nideffer (1976b) has used the ineffective attentional constructs of overinclusion and withdrawal to define behavioural tendencies at each end of his breadth dimension, while recognising that an overinclusion of either external or internal stimuli or both may occur within an individual. From these constructs Nideffer has suggested six different aspects of attentional behaviour, three involving effective use of attention and three concerned with ineffective control of attentional processes. The former are labeled as an effective broad external focus (BET), and effective broad internal focus (BIT), and an effective narrow internal and external focus (NAR). The ineffective processes are labeled as an overloaded external focus (OET), an overloaded internal focus (OIT), and an underinclusive internal and external focus (RED).

While criticism of the description of individuals using limiting measurements of attentional constructs has been noted earlier, these six attentional categories have not been used in such a manner. A pool of unambiguous items was developed reflecting behavioural experiences considered important for predicting performance and making specific treatment recommendations. Observations of attentional behaviour of normals and subnormals have enabled such a pool of items to represent behaviour and performance in a wide range of life situations. Nideffer (1976b) claims that the use of a wide range of situations across the 52 attentional items leads to considerable predictive validity of performance in almost any life situation. However he also recognised the need for assessment devices to be as situation specific as possible if attentional processes and behaviour are to be examined in a particular setting.

A person's total score for each of the six attentional categories in the TAIS can be compared to the average score of a large group of individuals from a similar population. Nideffer (1976a) noted however, "of much more importance than the elevation of a particular scale is the profile configuration, the elevation of one scale relative to the scores you make on other scales" (p. 118). He distinguished between an ineffective and effective attentional profile amongst other types. Poor attenders score higher on the scales indicating ineffective functioning (OET, OIT, RED) than they do on scales indicating effective functioning (BET, BIT, NAR), while the converse will be true for optimal performers as far as attentional processes are concerned. An interpretation of the former type suggests that these people cannot narrow their attention in order to avoid becoming overloaded, distracted,

and confused when presented with a large number of stimuli. When the situation requires it, they will be unable to shift attention from an internal focus to an external one, or vice versa (Nideffer, 1976a).

The attentional demands of individual life or job situations can also be combined to establish the optimum attentional profile or style (across the six categories) for a cluster of situations or, for example, a particular job or activity (Nideffer, 1977a). A person's attentional profile may then be compared to the optimum performance attentional requirements as a predictive device. If that attentional state matches environmental demands, the person functions with maximum effectiveness. On the other hand, if attention is inappropriate, mistakes will occur and performance will suffer. The more dominant one type of attention is, the more mistakes a person is likely to make (Nideffer, 1977a). Thus, in terms of predicting an individual's general level of effectiveness, Nideffer (1977a) sees two factors as important, viz., the person's flexibility and control over width and direction of attention, and also the demand for flexibility in a particular environment.

Supportive evidence for such a predictive instrument comes from testing police applicants (Nideffer & Wiens, 1975, 1976), students (Nideffer, 1976b), and various types of athletes (Nideffer, 1974, 1976a). The second major use of such an assessment device is in the recognition of attention deficits in particular situations. Attempts can then be made to correct such problems, for both the clinical patient and the athlete (Nideffer, 1978).

From the evidence presented earlier it may seem that subnormal

groups, such as schizophrenics, would tend to frequently exhibit extreme attentional behaviour, probably recognisable as very ineffective styles, while normal populations would be found with effective profiles. Payne (1966), for example, suggested that 50% of schizophrenics have overinclusive problems. Presumably the normal individual and the most problematic subnormal, in terms of attentional characteristics, would occupy positions towards each end of the effective-ineffective continuum. Though this may be a tendency such predictions are limited by the ability to accurately assess the attentional demands of any situation or activity for the individual (Nideffer, 1976b). Such an ability requires a clear understanding of all the interacting cognitive processes involved and the effect of perceived changes and occurrences in the environment on attention.

Broen (1966) suggested that a major environmental influence on attentional processes would seem to be an increase in perceptual load, resulting in a reduced attentional organisation and control, in accordance with Broadbent's filter model (1958). Nideffer (1979a) also recognises that the athlete's level of anxiety and arousal, together with the complexity of the task, the extent to which athletes must be able to shift to and maintain an external focus, and the base level of the relevant attentional abilities may all have an effect on performance. An understanding of a person's "normal" level of anxiety and arousal and how it alters in different situations, thus affecting attentional processes, would therefore seem important.

The following section will be concerned with the relationship between attentional abilities, arousal and anxiety levels, and performance.

Attention and Anxiety

Considerable research has been directed towards attentional capabilities and the effects of stress and anxiety on such processes. The actual relationship is fairly well established though a greater congruence in the use of terms such as arousal, drive, stress, and anxiety across physiological and psychological literature would often appear necessary.

Easterbrook (1959) defined drive as a dimension of emotional arousal or general covert excitement and the innate response to a state of biological deprivation or noxious stimulation. Drive has since been used in this context by Agnew and Agnew (1963) and Zaffy and Bruning (1966) among others, though Berlyne (1969) noted that the term arousal has largely taken its place. In response to noxious stimulation or stress, as perceived by the individual in an environment, Nideffer (1976b) noted that both arousal (physiological changes) and anxiety (psychological-emotional components) may be elicited. The need to differentiate between the two seems important to avoid confusion regarding the effects of stress on a person, and also because stress, arousal, and anxiety do not always go together. Nideffer (1976b) pointed out that a person may experience only changes in heart rate and respiration or may worry without physiological changes occurring. Anxiety may result from both stressful conditions in the environment and also from an awareness of arousal.

The use of the terms arousal and anxiety has so far been restricted to a relationship with perceived stress in the environment. However, both are also commonly recognised to exist at varying base levels across

individuals irrespective of the situation. State anxiety and arousal refers to the tendency of a person to become anxious or aroused in a particular stressful situation, while trait anxiety or arousal refers to the tendency of an individual to maintain a certain level of concern (anxiety) or tension (arousal) across situations of varying intensity (Nideffer, 1974). The importance of such a distinction becomes apparent when the effects of a particular situation on an individual are examined.

What then are the effects of anxiety and arousal on attentional abilities? Kahneman (1973) reviewed the literature and reported several effects. High arousal is associated with narrowing of attention, increased lability (scanning) of attention with a corresponding increase in distractability, and difficulty in controlling attention by fine discriminations. Failure to adopt a task set and failure to evaluate one's performance, resulting in an insufficient adjustment of investment of capacity to the demands of the task, are recognised as the attentional malfunctions of an extremely low arousal. Landers (1978) noted that the amount of research reporting a perceptual narrowing accompanying arousal is impressive. Easterbrook (1959) formulated some hypotheses regarding the narrowing of cue utilisation following arousal, which have since been substantiated by Agnew and Agnew (1963), Korchin (1964), Wachtel (1968), and Wine (1971) among many others. Bacon (1974) noted that research has found that arousal will tend to narrow the range of cues processed by systematically reducing responsiveness to those aspects of the situation that initially attract a lesser degree of attentional focus. While peripheral cues are increasingly ignored with greater arousal, Easterbrook (1959) suggested that central cues are augmented

until even they are reduced with more extreme arousal. However Bacon (1974) disagreed with the idea of augmentation. Wachtel (1967) distinguished between the width of focus and the ability to scan the field of stimulation. Evidence from Callaway and Stone (1960) and Korchin (1964) plus clinical observation according to Kahneman (1973) suggested that while the width of focus is reduced, extremely high arousal may lead to an increase in scanning and a consequent disorganization of behaviour. The problem of controlling attention by fine discrimination was discussed by Kahneman in terms of a capacity model. He noted that the allocation of capacity becomes both more uneven and less precise when arousal was high and although subjects tended to become more selective in terms of the number of relevant cues, the effectiveness of their selections was likely to deteriorate, if the selection required a fine discrimination. This is in agreement with the Yerkes-Dodson law which Easterbrook (1959) accommodated in his hypotheses. A complex task or stimulus field, requiring fine discrimination, should have a low level of arousal while a simple task requires a relatively high level for optimal performance.

While the effects of arousal on attentional processes have been experimentally supported by physiological measurement, the literature has frequently allowed anxiety to be loosely interchanged with arousal (Martin, 1961). The "normal" physiological function of blood pressure, muscle tension, heart rate, and adrenalin levels have all been used to indicate trait arousal (and anxiety) while changes in these autonomous levels in particular situations have been recorded to indicate state arousal (Oxendine, 1970). Duffy (1976) for example suggested that

physiological measurement of arousal affords, when other factors are constant, a direct measure of the motivating or emotional value of the situation to the individual while Oxendine (1970) also recognised that there was a high degree of overlap in both physical and physiological reactions. However Schachter (1964) noted the importance of a cognitive element in the interpretation of a situation as stress inducing and therefore a control of activating (or arousal) potential. Instead, physiological measurements have been made in a limited number of situations and inferences have then been made concerning the perceived psychological stress for the individual. Other problems with physiological measurements have been the inconsistency of arousal levels between different measurement techniques (Duffy, 1957). Weltman and Egstrom (1966) exemplified some of these problems by attempting to measure the width of attention of divers in a situation that would appear to be stressful, particularly to novices. While arousal levels could not be measured by the usual physiological procedures, unpredictable results suggested that there were individual differences in psychological concepts such as motivation, preoccupation, and imperceived fear.

To overcome such problems more direct attempts have been made to record the level of anxiety and psychological effects on attentional processes. Wine (1971) made an attentional analysis of test anxiety. This analysis was concerned with how the subjects controlled their cognitive activity (what they were thinking about and attending to) while taking little interest in autonomic arousal per se. He noted that the degree of arousal is irrelevant unless the subjects are attending to their indicants of arousal. This, he added, is unlikely unless arousal is

extremely high and physiological reactivity may be distracting. Wine (1971) reviewed research which revealed that high test anxious subjects turn their attention inward towards a self-evaluative and decision making rumination particularly in stressful conditions, while low anxious persons focus more fully on the task cues. Liebert and Morris (1967) divided test anxiety into a worry component, described as cognitive concern over performance, and an emotionality component concerned with autonomic arousal. Wine (1971) suggested that the worry component seemed closely related to an attentional interpretation of test anxiety and that the adverse effects of test anxiety are due to attention being divided between self and task. In conclusion Wine made several other interesting points supported by research. He suggested that a complex task requiring full attention will show the greatest performance differences between the self-focusing high anxious subjects and task-focusing low anxious. Secondly, in agreement with studies reporting the effects of arousal on width of attentional focus, Wine reported research that suggests anxiety will tend to reduce the range of task cues utilised in performance. Finally, while relating particularly to the test situation, "worry," an attentionally demanding cognitive activity, was recognised as more debilitating to task performance than autonomic arousal. Clearly then anxiety and attentional control along both the width and directional dimension would appear to be closely related, following an attentional interpretation of test anxiety by Wine.

Discussion of the relationship between anxiety and attention has been limited to the effects of stress prior to and during performance. Horowitz (1975) seems to be one of the few concerned with cognitive

behaviour after a stress inducing situation. He reported that while clinical research had found patients become involved in intrusive and repetitive thoughts following considerable stress, normals were found to have similar cognitive processes to a lesser degree after mild experimental stress. Those who reported higher levels of stress in this case also had higher levels of intrusive thoughts. From the very implication of intrusive thoughts Horowitz's work would seem to support the notion that the direction of attentional focus may be controlled by an anxiety inducing situation, according to the degree of perceived stress encountered.

Much of the evidence for the interpretations presented has come from pencil and paper self-report tests designed to measure anxiety proneness in a specific kind of stressful situation. An example of such a test is the Test Anxiety Questionnaire designed by Mandler and Sarason (1952) which related specifically to the subject's reactions to testing situations. It was expected that these tests would be more predictive of behaviour in these situations than a more general trait anxiety scale such as the Taylor Manifest Anxiety Scale (Taylor, 1953). Similar tests have since been developed to measure state anxiety levels in different situations and these are listed by Spielberger (1972). He is also responsible for the development of a widely used instrument called the State-Trait Anxiety Inventory from which measures of A-Trait and A-State may be gained. A-Trait measures reflect a person's proneness to anxiety in social situations, whereas the A-State scale of the inventory was designed to measure emotional reactions that consist of feelings of tension and apprehension and heightened activity of the autonomous

nervous system. Spielberger also suggested that A-Trait measures reflecting a particular class of stress situation are more predictive of behaviour than are general A-Trait measures.

The relationship between anxiety levels and attentional processes would seem to be well supported by research and fairly clearly understood. Therefore if we can accurately assess the behavioural pattern of individuals across stressful situations of varying significance we may also gain a reasonable measure of attentional behaviour and capabilities. Subjective measures of anxiety in particular situations would appear to adequately predict the dimensions of and ability to control attentional focus in similar situations. This may be especially true since it has been pointed out earlier that physiological and psychological reactions to stressful conditions often overlap.

In the first section, the importance of understanding the attentional requirement of different situations was recognised. Nideffer (1976b) noted that the more complex and rapidly changing a situation, the broader the attentional focus must be. However arousal and anxiety levels may affect the ability to maintain such a focus. A high trait anxious person may find it difficult to develop a wide focus, as would the person who finds that particular situation highly anxiety inducing. Nideffer (1976a) noted the importance of altering anxiety and arousal to develop an attentional focus appropriate for the attentional demands of the situation. He suggested that the person with a low level of natural arousal may require an increase in arousal to be able to narrow attention for a simple task requiring such a focus. Conversely a person with a higher level of trait anxiety may need to reduce arousal to

adequately perform a task requiring a broad focus of attention.

The implications of understanding such a relationship were discussed by Nideffer (1974). When matching up attentional styles with the attentional demands of a situation, consideration of the person's trait anxiety and how anxiety inducing that situation is for the individual should also be taken into account. Then perhaps, in terms of sport, "our ability for putting the right player in the right position or situations at the right time improves," and "we will (and I believe are) able to offer specific suggestions and exercises to help athletes gain control over attentional processes" (Nideffer, 1974, p. 167). Indeed hypnosis, relaxation procedures, and meditation have all been used to control anxiety and thus the ability to control the direction and width of attentional focus.

Nideffer has indicated the potential uses of matching attentional behaviour and the attentional demands in sport, if the relationship between anxiety, arousal, attention, and performance is to be fully understood. However, such a relationship has only recently been examined. The following section will be concerned with literature relating attentional abilities to sport involvement and performance.

Attention and Sport Performance

In the first section the axiom of attentional processes playing a fundamental role in determining how individuals respond to situations in general was discussed. In this section the intention is to discuss the literature concerned with attentional processes in relation to sport participation, performance, and the athletic environment. The importance of anxiety has also been discussed rather broadly and this

important mediator of attentional processes will also gain further recognition for its role in the sports situation.

Many of the attempts to measure attentional variables have been noted and include field dependency tests and introversion-extroversion tests in particular. Reaction time has also been commonly regarded as an accurate measure of attentional selectivity (Rotella & Bunker, 1978). However such measurement techniques assume attentional abilities to be dispositions, which allow generalisations to be made across many situations. Thus it has been inferred that a difference between subjects on a test to measure an attentional variable also reflects a difference in extralaboratory situations. Much of the research concerned with the relationship between attention and sport participation and performance has its roots in such an assumption.

Various studies have attempted to differentiate between athletes and nonathletes on the strength of their inferred attentional abilities. Barrell and Trippe (1975), using a rod-and-frame apparatus to measure field dependency, found athletes, with the exception of tennis players, were not significantly different from a nonathlete control group. However, Olsen (1956) found significant differences in reaction time and a measure of visual span between athletes and nonathletes. More recently Rotella and Bunker (1978) have reported significant differences between senior tennis players (over the age of 70 years) and a nonathlete group of similar age, using measures of field dependency and reaction time. In each case where significant differences were found, the athletes were seen to have more rapid reaction times, greater field independence, and a broader visual span than the nonathletes. A difference has also been

reported on the introversion-extroversion scale. Kane (1972) noted that female athletes demonstrated higher extroversion scales than female nonathletes. While there is evidence for and against differences between athletes and nonathletes along these cognitive dimensions, the methodology used is somewhat limiting to allow comparisons to be made in terms of attentional abilities.

Research concerned with differences between athletes participating in various sports has followed similar methodological procedures. Although the sport has usually been noted, differences between sport type such as "team" or "individual" have been of particular interest. Kane (1972) postulated that field dependency may be an advantage in the performance of "team" sports in which the performer is required to relate the skill to the environment. While Barrell and Trippe (1975) found no evidence to support this hypothesis, Pargman (1974) reported that if the field dependence scores for the football group were removed from the composite "team" score there would be no significant difference between the "individual" and "team" scores. In conclusion he suggested that while field dependence played a role in sport involvement, further research would be required in order to characterise a sport typology based upon that particular dimension of perceptual style. On the basis of the desired amount of stimulation, Dickinson (1977) amongst others suggested that extroverts would tend to be found in more intensely stimulating environments such as "team" sports whereas introverts would favour "individual" sports. Once again this hypothesis has been supported (Morgan & Costill, 1972) and refuted (Malumphy, 1968). Using a sport typology classification with considerable overlap to that just

discussed, Ryan and Foster (1967) found that those involved in contact sports tended to possess a perceptual pattern of the reducer while noncontact sportsmen were augmenters.

Following Pargman's (1974) suggestions it would seem that to characterise a sport typology based on any one dimension of perceptual style may not be feasible for the sake of predictive validity. Indeed each dimension is so broad that any correlation between a sport type and a measure of augmenting-reducing for example is of little consequence in terms of an inferred relationship between attentional abilities and a particular sports activity.

The sports psychology literature has frequently been concerned with differences between the "average" athlete and the "superior" performer. Attempts have been made to explain ability differences using innumerable psychological variables including attentional ability. Many of these studies have used perceptual style dimensions and their evaluative procedures, from which attentional factors may be inferred, thus following a similar methodology used to differentiate athletes and nonathletes and sport typology.

The use of field dependency measures has been popular in this area. Barrell and Trippe (1975) found significant differences between skilled and highly skilled tennis players though not for the sports of soccer, cricket, and track and field. The more skillful player attained greater field dependent scores. However Petrakis (1979), using varsity tennis players, found no significant differences between the high and low ranked, and similar results were also reported by Williams (1975) for the sport of fencing. An earlier attempt by Olsen (1956) to differentiate ability

levels on the basis of reaction time and width of visual span also provided inconclusive evidence. He combined the superior athletes and the intermediate athletes from the sports of soccer, baseball, hockey, and basketball and found a significant difference between the two composite groups on a reaction time measurement, but not on the test for span of apprehension.

While the importance of attentional abilities in sport performance is widely recognised, such inconclusive results may perhaps suggest that measures of attention are not really being gained from the tests used in the research just presented. Alternatively the attentional abilities required to be an athlete and to participate in a particular sport, or to be a superior athlete, are not so generalisable that they may be measured by any single perceptual test. However, even a study by Torres (1966) relating children's ball catching ability to the attentional demands of a figure-ground perceptual test found no significant relationship. Sheedy (1971) suggested that the time for a basketball free throw to be taken reflected the ability to concentrate or channel attention in a given direction. The fact that no relationship was found between concentration time and success in the free throw pointed to the presence of other mediating variables. It was suggested that other factors such as arousal and anxiety caused by the game score, the time remaining, the number of spectators, and shots already missed in the game may have had substantial effects on this situation. Nideffer (1976c) suggested that concentration time can be used as an important indicant of arousal in situations such as waiting to bowl, perform a dive, take a free throw, or serve in tennis. He also reported data which suggested that a diver's

poorest performance took place following longer concentration times, due to over arousal and muscle tension.

A detailed situational analysis to determine which attentional processes and abilities are required and how these are affected by other variables would seem meaningful. Cratty (1973), Gallwey (1974), Herrigel (1964), Nideffer (1971, 1978), and Wiren and Coop (1978) have all described sports situations in which an appropriate focus of attention and concentration would appear to be fundamental, from both observation and interview. Cratty (1973) suggested that "divergent thinking" was necessary in working out all possibilities for viable game strategies and "convergent thinking" (p. 284) would help in deciding upon the best alternative among many while actually participating. The ability to analyse team interactions or opponent's skills and weaknesses was also noted. While such attentional demands may be required in many sports, Gallwey (1974) referred specifically to tennis, Herrigel (1964) to archery, Nideffer to diving (1971) and skeet shooting (1978), and Wiren and Coop (1978) to golf.

Earlier reference to sport typology differentiated "team" and "individual" sports. Although attentional demands in each of these sport types may differ, such categorisation may still be too broad. The attentional demands for tennis, for example, would not be wholly complementary to those for golf and yet each are commonly referred to as "individual" sports. Singer (1975) suggested that "team" sports largely involve externally-paced, perceptual, and open skills, while "individual" sports were more related to self-paced, habitual, and closed skills. Externally-paced skills, such a rallying in tennis, demand the

perception of an unstable environment, while self-paced tasks, such as hitting a golf ball, require less concern for perceptual adjustment and more about the appropriate sequence of responses (an inward focus).

Both Singer (1975) and Dickinson (1977) discussed the distinction between habitual and perceptual skills. A habitual skill would be performed in a relatively stable environment with the performer's attention directed to the act itself, following considerable practice which largely automated the response. A perceptual skill would require a high responsiveness to an often unpredictably changing environment. In terms of sport, habitual skills are characterised by track and field events such as shot put and high jump, diving and gymnastics, whereas tennis, basketball, and fencing are noted for being perceptually oriented.

The open-closed skill categorisation may be used to differentiate between those closed tasks such as archery that are repetitive, monotonous, and demand little if any width in perceptibility, and open tasks requiring awareness of much of the environment as it changes (Singer, 1973). Nideffer (1974) acknowledged that open skills require the individual to be both aware of and able to respond to a complex and rapidly changing environment. Landers (1978) suggested that "this would be characteristic of the quarterback and linebacker responsibilities in football, a three on two fast break in basketball and soccer, and a double play in baseball" (p. 82).

The classification of sports by their different skill requirements has led to a serious consideration of the attentional demands of individual situations and positions. While attempts have been made to correlate "team" or "individual" sports with a particular type of

attentional demand, it can now be seen that a sport may require several types of attentional ability as situations change. Indeed the ability to change attentional focus as new situations arise has been noted. Nideffer (1974) stated that "to perform effectively, the athlete must be capable of responding to those demands" (p. 163) of a changing environment. Changing from one type of attention to another is referred to by Nideffer as a "flip-flop" mechanism. It is hardly surprising that much of the literature attempting to define the attentional demands of a sport has been concerned with those involving mainly closed skills (Gallwey, 1974; Herrigel, 1964; Nideffer, 1971, 1978; Wiren & Coop, 1978). However Nideffer (1976b) also attempted to define the attentional demands for a wide range of sports and activities, from the football linebacker to swimming distance events, though no mention is made of soccer. Following the attentional dimensions of width and direction he suggested which type of focus would be required for each activity or position within a sport, and also across sports generally. For example, to analyse an opponent a broad focus would be appropriate, whereas to maintain motivation a narrow internal focus was recommended.

It would seem, therefore, that by asking athletes how they behave or what they are focusing on in a given situation, we can record how well they are capable of responding to the attentional demands of this and similar situations. However, Nideffer (1976a) recommended that the mere assessment of an attentional style and the attentional demands of a situation is not enough to predict how an individual will perform. Consideration must also be made for anxiety and arousal as they are natural components of most athletic competitions and have a direct effect

on attentional processes. The effects of anxiety and arousal on attentional processes were noted in section two. While this relationship may seem fairly predictable, the myth of increasing arousal to improve athletic performance, held by many coaches and athletes, has largely helped to shadow the effects on attentional processes.

Oxendine (1970) shared the commonly accepted view that a high level of arousal is essential for optimal performance in gross motor activities involving strength, endurance, and speed. On the negative side, a high level of arousal interferes with performance involving complex skills, fine muscle movements, coordination, steadiness and general concentration. Landers (1978), therefore, suggested that sports demanding narrower attentional focus, such as gross motor activities, can tolerate higher levels of arousal since fewer task cues are susceptible to elimination through attentional narrowing. A sports situation in which a broad attentional focus must be maintained requires minimal or reduced arousal. Nideffer (1974) also noted that if arousal causes attention to be directed internally (thoughts and feelings) when an external focus is required, performance will be impaired. A further suggestion was made (Nideffer, 1976a) that a superior sports performer probably not only has more extreme measures on attentional dimensions but is also able to maintain these extremes while under pressure or is able to control anxiety and arousal levels as the situation demands.

Previous attempts to relate laboratory tests to sport behaviour and performance have been largely inconclusive. Sport psychologists have called for new techniques that reflect behaviour in the sports situation. Nideffer (1976b) developed the Test of Attentional and Interpersonal

Style (TAIS) in an attempt to gain behavioural measures of attentional dimensions through self-report techniques. He has claimed that the range of life situations within the TAIS are adequate to be able to predict attentional performance in other situations including that of swimming (Nideffer, 1974) and other athletic endeavours. At the same time he has recognised the need for assessment devices to be as situation specific as possible if attentional processes and behaviour are to be examined in a particular setting (Nideffer, 1976b). Rushall (1975) has also stated that "a single instrument to assess participants in many sports does not appear to be satisfactory. The measurement of behaviour at least in specific sports would be more appropriate" (p. 50). Following these guidelines several attempts have been made to measure various psychological variables in sport settings. Horsfall (1975) developed an S-R inventory of anxiousness specifically related to basketball, while Czarnecki (1977) followed with a similar inventory related to football situations. An S-R inventory of hostility related specifically to situations in ice hockey, lacrosse, and soccer was devised by Burton (1977). Under the guidance of Rushall, Ebeze (1975) constructed a psychological inventory for competitive soccer, though there was little concern for attentional processes and abilities.

With the assessment of psychological variables through a sport specific situational approach in vogue, a similar methodology would seem appropriate to assess the attentional behaviour or style of soccer athletes. Such an approach would also allow consideration for the effects of stress, an important moderator variable on attentional processes, in the soccer environment.

Summary

Attentional processes and capabilities have been regarded by many to be of major signifiance in terms of human behaviour and performance. The volume of attentional literature, reviewed by Berlyne (1969) and Murray (1974), would seem to add support to this suggestion. However the methodology used in psychological research has contributed to an inconsistency in the findings of research attempting to relate attentional capabilities to behaviour in various settings.

The methodological problems with a trait approach are particularly apparent from the attempts to assess attentional style. The customary attempts to relate attentional capabilities to behaviour have been through a trait approach, where the individual is believed to have a dominant type of attention irrespective of the situation. This was originally referred to as a cognitive style (Witkin, 1962), later a perceptual style, and more recently a person's attentional style (Denney, 1974; Silverman, 1964; Wachtel, 1967). The trait approach has involved the assessment of attentional behaviour through single laboratory tests such as the body-adjustment test, the rod-and-frame test, and the embedded-figures test (Witkin, 1962), all designed for field dependency. Other laboratory tests have been designed to assess scanning behaviour (Gardner & Long, 1962), augmenting-reducing (Petrie, Collins, & Soloman, 1960), introversion-extroversion (Eysenk, 1959; Voth, 1962), and locus of control (Rotter, 1966). Attentional behaviour and style has been inferred from these cognitive control principles assessed in the laboratory and related to human behaviour in extralaboratory environments with inconclusive results.

The trait paradigm has lost popularity in recent years and critics have called for a new methology in psychological research. McClelland (1973) questioned the validity of making inferences across a variety of situations, while Mischel (1968) commented on the lack of predictive validity provided by the trait approach. Wallace (1966) recommended that behavioural competencies such as attention, should be assessed in particular situations where the behaviour is to be examined. This involves the recognition of which attentional behaviours are required in particular environments and how they may be influenced by other variables such as anxiety and arousal. The attentional constructs used to formulate attentional style with a trait approach highlighted the need for unambiguous test variables.

In accordance with the recent situational approach to the assessment of psychological variables, Nideffer (1976b) developed the Test of Attentional and Interpersonal Style (TAIS). The first part contains situations selected to gain measures of attentional competencies in a variety of life situations. The competencies are drawn from attentional constructs established through traditional research with cognitive control principles. While Denney (1974), Heilbrun (1971, 1972), Pelletier (1974), Silverman (1964), and Wachtel (1967) considered the attentional constructs adopted by Nideffer, he was the first to recognise attentional style in terms of both a breadth of focus and direction of focus. Attentional research in clinical psychology contributed ineffective attentional constructs. The attentional part of the TAIS is based on six constructs, three effective and three ineffective types of attentional focus. The effective scales include a broad external and

internal focus and a narrow focus, while the ineffective scales include an overloaded external and internal focus and an underinclusive focus of attention.

Kahneman (1973) and Landers (1978) examined the effects of anxiety and arousal on attentional processes as reported in the literature. Nideffer (1976b) also recognised the importance of stress on attention and suggests that the TAIS includes adequate consideration for the appraisal of a person's anxiety in particular situations.

While attempts to relate attentional behaviour on laboratory tests to sport performance and participation were inconclusive, Nideffer (1976b) claims that the TAIS assesses generalisable attentional competencies which are also applicable to the sport environment. He reports some success in predicting sport performance (Nideffer, 1974) but also recommends that assessment devices be as situation specific as possible if behaviour is to be examined in a particular setting. A sport specific situational approach has been adopted by sport psychologists such as Rushall (1975) to assess various psychological variables although there has been no attempt to develop a soccer specific inventory concerned with attentional processes and abilities.

Chapter 3

METHODS AND PROCEDURES

It is intended to present the methods and procedures that were used in the gathering and analysis of data in this chapter. The following areas are described: selection of subjects, testing instruments, methods of data collection, and treatment of data. A final section summarises the methods and procedures used in this study.

Selection of Subjects

The subjects involved in this study (n = 104) were varsity and junior varsity players at educational institutions in the Central New York area during the spring of 1979. Availability and opportunity limited the investigator to 6 subjects from Clarkson University, 19 from Cornell University, 15 from Cortland State University, 32 from Ithaca College, 6 from LeMoyne College, 18 from Oswego State University, 4 from St. Lawrence University and 4 athletes from Tompkins Cortland Community College. All subjects were college males with a wide range of playing experience (2-14 years) though only athletes with outfield experience (not goalkeepers) were used in the study. To gain measures of reliability for the testing instruments, 23 of the Ithaca College subjects were retested, once again in accordance with availability.

Testing Instruments

The Test of Attentional and Interpersonal Style (TAIS), in part, was administered together with a test of soccer attentional style (TSAS) and a personal assessment questionnaire (PAQ) for success and ability in soccer.

The TAIS, developed by Nideffer (1976b), consists of 52 situations, relating to attentional processes, randomly located within the first 78 items of the test. The statements relate to attentional behaviour and performance across a range of life situations. Three types of effective attentional behaviour and three ineffective types are represented by the situations. These are broad external focus (BET), broad internal focus (BIT), narrow focus (NAR), overloaded external focus (OET), overloaded internal focus (OIT), and underinclusive focus (RED). While some of the situations represent more than one of the six scales, 6 situations are pertinent to the BET focus, 8 to the BIT, 12 to the NAR, 12 to the OET, 9 to the OIT, and 15 to the RED focus of attention. Subjects are required to rate each situation for the frequency of occurrence on a 5-point continuum ranging from "never" to "always."

Nideffer (1976b, 1977b) reports some construct validity for the TAIS while noting that there is very little overlap between tests designed to measure similar attentional constructs to those employed by the TAIS. Construct validity was offered for the attentional scales of BET focus, OIT focus, and RED focus. Some predictive validity has also been identified for the TAIS attentional scales. Correlations of $\underline{r}$ = .59 to $\underline{r}$ = .80 (with no degrees of freedom or probability levels presented) are reported between the attentional scales and actual behaviour measures of swimmers (Nideffer, 1976b). Test-retest reliability coefficients for all the 17 TAIS scales range from .60 to .93 (Nideffer, 1976b).

The TSAS consists of 74 situations relating to attentional behaviour and performance in the competitive soccer environment. These were chosen from an original list of 110 situations intuitively written, with the

assistance of several soccer coaches and players. Elimination of the situations was made on the basis of which situations were probably most tangible to the athletes either through direct or vicarious experience and also to gain a range of situations over the whole spectrum of the game (other than goalkeeping) while avoiding unnecessary overlap of situations. Of the 74 situations selected, 13 related to the BET scale, 13 to the OET scale, 12 to the BIT scale, 14 to the OIT scale, 11 to the NAR scale, and 15 to the RED scale (Appendix B). A random numbers table was used to randomly list all the situations.

The final test of soccer attentional style, like the TAIS, employed a Likert scale which requested subjects to indicate the extent to which they manifested the behaviour described in each situation. A 5-point scale was considered appropriate, ranging from "never" to "always." Here what is "never" and "always" was dependent entirely upon the person's individual frame of reference or perception of the labels. While the TAIS contained items largely in a positive (pro) direction with six in a negative (con) direction, the TSAS, following a similar pattern, accomodated 10 items in a negative direction. These items were numbered 20, 33, 41, 46, 59, 64, 68, 69, 74, and 75 (Appendix A).

The TSAS was designed in a similar fashion to the TAIS, with the name of the test and the test instructions on the cover sheet, followed by the randomly listed situations on succeeding pages.

The personal assessment questionnaire (PAQ) was constructed to record perceived success and ability in soccer, using a semantic differential technique with a 5-point scale (Appendix C). The subject was required to respond to a "in soccer I have been" statement on six bipolar adjective

scales, and to the statement "my soccer ability is" on nine bipolar adjective scales. Adjective pairs were listed in both a positive and negative direction in order to minimise response bias. Once again the person's individual frame of reference or perception of the labels determined how each adjective was interpreted.

In the design of the single page PAQ, space was provided at the head of the page for the name and institution of the subject, and also the number of playing years or experience. Below this, brief instructions are followed by the semantic differential assessment device with answer spaces provided between the 15 bipolar adjective pairs.

Methods of Data Collection

The situations in which data were collected varied considerably from quiet places unrelated to the soccer milieu (such as the library), to the area encompassing the field of play prior to or following practice. Data were collected from subjects individually or in groups of up to 12 athletes depending on convenience for the players and investigator.

At each meeting the subjects were provided with a single package containing an informed consent form, a Test of Attentional and Interpersonal Style (TAIS) booklet, a test of soccer attentional style (TSAS) booklet, a single page personal assessment questionnaire (PAQ) and a #2 pencil. Each booklet contained two loose computer markread answer cards.

Following the distribution of packages, the investigator withdrew the informed consent form from a typical package and asked the subjects to read and complete the form (by signing) if they were willing to participate in the study. Only two subjects returned the package at this stage. The investigator then drew attention to the instructions first on

the TAIS booklet, then the PAQ, and finally the TSAS booklet, requesting that the tests were to be completed in that order as numbered. This was to break any possible monotony in attending to a large number of Likert-scale items. It was also pointed out that if any ambiguity or uncertainty existed in the minds of the subjects, regarding the exact situation being described, then they were to answer according to their own individual perception of the situation. An opportunity was given for questions followed by a suggestion that although time was unlimited to complete the tests most people would require approximately 25-30 minutes. This was an attempt to prevent subjects from spending time returning to alter answers as they progressed through the testing instruments, rather than taking each item or situation on its own merit.

Between 3 and 5 weeks after the first administration, 23 Ithaca College athletes completed the three tests for a second time. The second administration took place in accordance with availability of subjects and followed the same procedure as above. Subjects were tested individually or in groups of up to five athletes in quiet places unrelated to soccer environments.

Scoring of Data

The data from the TAIS and the TSAS, collected on markread computer cards, were submitted to the computer. Likert-type values ranging from 1 to 5 substituted the markread card "A" to "E" scores except for items with a negative direction when "A" = 5 and "E" = 1. For each adjective pair on the PAQ a number value ranging from 1 to 5 was determined, with 5 representing the most positive judgment. A total score from the six success pairs and a score from the nine ability pairs

was then calculated by hand. The success and ability scores, together with a score for the total number of years involved in competitive soccer, were then transferred to data cards for computer analysis.

Treatment of Data

The stability of the TAIS and the TSAS was determined by test-retest coefficients after a 3-to 5-week interval using Pearson product-moment correlation.

The internal consistency for each of the six scales on both the TAIS and the TSAS data was examined using Cronbach's coefficient alpha (Cronbach, 1951).

The 104 subjects were ranked according to their ability scores, success scores, and experience scores. To establish a high and low group for each of the variables ability, success, and experience, it was thought appropriate to take approximately the top and bottom third subjects on each ranking. However the actual number was not 33, as the dissection took place at the nearest natural break in the lower ranked scores. For example, all the 32 subjects with scores of 22 or less on success were classified as relatively less successful athletes. Only the top 32 were recognised as successful, while this left subjects with equal success scores both within and outside the high level group. Similarly, from the rankings on ability, the lower 34 subjects (with scores of 33 or less) were classified as low ability and the upper 34 as high ability athletes. From the rankings on experience, the lower 36 subjects (with five or fewer years playing experience) were grouped as relatively less experienced and and the upper 36 as experienced soccer athletes.

A multivariate and univariate analysis of variance programme

(BMD.12V) was performed to assess the effects of level of ability, level of success, and experience level on the six variables of the TAIS and the TSAS. A full matrix using a programme entitled FULMAX was then created, followed by a discriminant function analysis. This programme entitled HEINV (Harris, 1975) was used to determine the greatest characteristic root, and the vectors associated with it.

Summary

The intention of this study was to construct a test of soccer attentional style and administer it, together with a Test of Attentional and Interpersonal Style (Nideffer, 1976b), to soccer athletes. A personal assessment questionnaire was also developed to gain self-report measures of ability, success, and experience in soccer.

Members from eight Central New York college and university soccer teams served as subjects (n = 104) in this study.

Internal consistency for each of the six attentional scales from both the TAIS and the TSAS data was reported. A second administration of the testing instruments was given to a sample of the subject population (n = 23) 3 to 5 weeks after the first administration to determine test-retest reliability for these instruments.

The athletes were ranked and approximately the top and bottom third were classified as high and low ability, successful and less successful, and experienced and less experienced, respectively. Six separate multivariate analyses of variance were performed to assess the effects of level of ability, success, and experience on the attentional variables from both the TAIS and the TSAS. A programme entitled HEINV was used to determine which attentional variables contributed to any significant differences

between the ability, success, and experience groups.

Chapter 4

ANALYSIS OF DATA

The results of the investigation are presented in this chapter. The chapter is divided into the following major sections: (a) test-retest reliability for the attentional scales of the test of soccer attentional style (TSAS) and the Test of Attentional and Interpersonal Style (TAIS), (b) test-retest reliability for the ability and success scores of the personal assessment questionnaire (PAQ), (c) coefficient alpha reliability for the attentional scales of the TSAS and the TAIS, (d) multivariate and univariate analysis of variance and discriminant function analysis for ability levels with the attentional scales of the TSAS, (e) multivariate and univariate analysis of variance and discriminant function analysis for success levels with the attentional scales of the TSAS, (f) multivariate analysis of variance for experience levels with the attentional scales of the TSAS, (g) multivariate and univariate analysis of variance and discriminant function analysis for ability levels with the attentional scales of the TAIS, (h) multivariate and univariate analysis of variance and discriminant function analysis for success levels with the attentional scales of the TAIS, (i) multivariate analysis of variance for experience levels with the attentional scales of the TAIS, and (j) summary.

Test-retest Reliability for the Attentional Scales of the TSAS and the TAIS

The test-retest coefficients for the TSAS and the TAIS scales for the 23 subjects who retook the tests after a 3-5 week interval are

tabulated in Table 1. The BET attentional scale refers to a broad external focus of attention, the OET scale to an overloaded external focus, the BIT scale to a broad internal focus, the OIT scale to an overloaded internal focus, the NAR scale to a narrow effective focus, and the RED scale to an underinclusive focus of attention. The test-retest reliability coefficients, a measure of response stability, ranged from a high of .92 for the BET and OIT scales to .81 with the BIT scale, for the TSAS scales. The range of coefficients for the scales of the TSAS was .11.

The TAIS test-retest coefficients ranged from a high of .73 for the BIT scale to a low of .36 for the NAR scale. The range of coefficients for the scales of the TAIS was .37.

Test-retest Reliability for the Ability and Success Scores of the PAQ

The test-retest coefficients from the ability and success scores of the PAQ for the 23 subjects who retook the test after a 3-5 week interval are reported in Table 2. The test-retest reliability for the ability scores was .72 and .86 for the success scores.

Coefficient Alpha Reliability for the Attentional Scales of the TSAS and the TAIS

Coefficient alpha is a measure of the internal consistency of a test or its subsets. The coefficient alpha reliabilities for each of the six attentional scales of the TSAS and the TAIS are tabulated in Table 3. The alpha reliability for the scales of the TSAS ranged from a high of .83 for the BIT scale to a low of .67 for the NAR scale. The range of alpha for the TSAS scales was .16.

Table 1

Test-retest Reliability for the Attentional Scales of the TSAS and the TAIS

Attentional Scale	TSAS r	TAIS r
BET	.92	.69
OET	.83	.72
BIT	.81	.73
OIT	.92	.69
NAR	.91	.36
RED	.85	.72

Note. Both tests were administered to 23 subjects 3-5 weeks after the initial administration.

Table 2

Test-retest Reliability for the Ability and Success Scores of the PAQ

Variable	r
Ability	.72
Success	.86

Note. PAQ readministered to 23 subjects 3-5 weeks after initial administration.

Table 3

Coefficient Alpha Reliabilities for the Attentional Scales of the TSAS and the TAIS

Attentional Scale	TSAS $\underline{a}$	TAIS $\underline{a}$
BET	.74	.70
OET	.72	.69
BIT	.83	.49
OIT	.79	.70
NAR	.67	.27
RED	.76	.49

The coefficient alpha reliabilities for the TAIS scales ranged from a high of .70 for the BET and OIT scales to a low of .27 for the NAR scale. The range of alpha reliabilities for the TAIS scales was .43.

Multivariate and Univariate Analysis of Variance and Discriminant Function Analysis for Ability Levels with the Attentional Scales of the TSAS

A multivariate analysis of variance (MANOVA) for ability levels (high and low) with the TSAS variables revealed significant overall group differences, θ (1, 2, 29.5) = .68, $p < .01$. The finding of a significant difference between the groups led to the acceptance of the first hypothesis that there would be a significant difference between the scores on the TSAS attentional scales for soccer athletes who regard themselves to be of high ability and those of low ability.

Univariate analyses of variance (ANOVA's) for ability levels with each of the variables of the TSAS revealed a significant group difference ($p < .05$) for each of the six variables. The high ability group reported higher BET, BIT, and NAR means and lower OET, OIT, and RED means than the lower ability group. The results are reported in Table 4.

Discriminant function analysis on the TSAS variables revealed the percent contribution that each variable made to the overall significant between groups difference. The major contributing variables and their respective contributions are reported in Table 5. The BET scale contributed 37.34%, followed by 33.04% from the BIT scale, and 25.17% from the NAR scale. Thus, these three scales contributed 95.55% of the total variance to the between ability groups difference.

Table 4

Means, Standard Deviations, and Analysis of Variance for Ability Levels with the Attentional Scales of the TSAS

Attentional Scale	Low Ability		High Ability		
	M	SD	M	SD	F
BET	42.03	4.32	49.15	3.93	42.8180*
OET	32.76	4.66	28.59	5.25	13.7929*
BIT	39.65	4.47	47.41	5.39	43.6960*
OIT	37.71	4.87	32.44	6.62	19.0955*
NAR	27.41	4.34	40.85	5.12	29.5595*
RED	37.97	5.65	32.79	1.50	16.9579*

*$p < .05$

Table 5

Discriminant Function Analysis on the Attentional Scales of the TSAS Contributing to Between Ability Groups Difference

Variable Ranking	Standardized Discriminant Weight	Percent of Contribution
1. BET	-.61109	37.34
3. BIT	-.57484	33.04
5. NAR	-.50170	25.17
	Total	95.55

Multivariate and Univariate Analysis of Variance and Discriminant Function Analysis for Success Levels with the Attentional Scales of the TSAS

A MANOVA for success levels (successful and unsuccessful) and the TSAS variables revealed significant overall group differences, θ (1, 2, 27.5) = .50, $p < .01$. The finding of a significant difference between groups led to the acceptance of the third hypothesis that there would be a significant difference between the scores on the TSAS attentional scales for soccer athletes who regard themselves as successful and those who do not.

Separate ANOVA's for success levels with each of the variables of the TSAS revealed a significant ($p < .05$) group difference for each of the six variables. The successful group reported higher BET, BIT, and NAR means and lower OET, OIT, and RED means than the less successful group. The results are reported in Table 6.

Discriminant function analysis on the TSAS variables revealed the percent contribution that each variable made to the significant between groups difference. The major contributing variables and their respective contributions are reported in Table 7. The largest single contributor was the BET scale with 50.63% of the variance, followed by the OIT scale with 20.30%, the OET scale with 19.01%, and the RED scale with 12.68%. Thus, the total variance contributed to the between success groups difference from these four scales was 92.62%.

Table 6

Means, Standard Deviations, and Analysis of Variance for Success Levels with the Attentional Scales of the TSAS

Attentional Scale	Less Successful		Successful		
	M	SD	M	SD	F
BET	43.00	4.87	48.47	4.45	18.0908*
OET	30.47	4.98	28.03	5.59	19.3969*
BIT	41.53	5.29	46.59	5.59	12.2356*
OIT	37.53	5.24	31.00	5.97	23.0236*
NAR	36.22	4.91	41.31	4.75	16.0596*
RED	38.13	5.37	31.63	5.19	20.1503*

*$p < .05$

Table 7

Discriminant Function Analysis on the Attentional Scales of the TSAS Contributing to Between Success Groups Difference

Variable Ranking	Standardized Discriminant Weight	Percent of Contribution
1. BET	.63742	40.63
4. OIT	-.45059	20.30
2. OET	-.43596	19.01
6. RED	-.35606	12.68
	Total	92.62

Multivariate Analysis of Variance for Experience Levels with the Attentional Scales of the TSAS

A MANOVA for experience levels (experienced and inexperienced) with the TSAS variables revealed no significant overall group differences, θ (1, 2, 31.5) = .16, $p > .05$. The finding of no significant difference between the groups led to the rejection of the fifth hypothesis that there would be a significant difference between the scores on the TSAS attentional scales for soccer athletes who have considerable experience and those who have participated for only a few years.

Multivariate and Univariate Analysis of Variance and Discriminant Function Analysis for Ability Levels with the Attentional Scales of the TAIS

A MANOVA for ability levels (high and low) with the TAIS variables revealed significant overall group differences, θ (1, 2, 29.5) = .42, $p < .01$. The finding of a significant difference between the groups led to the rejection of the second hypothesis that there would be no significant difference between the scores on the TAIS attentional scales for soccer athletes who regard themselves to be of high ability and those of low ability.

Separate ANOVA's for ability levels with each of the variables of the TAIS revealed a significant ($p < .05$) group difference for only the BET and BIT scales. The high ability group reported higher BET and BIT means than the lower ability group. The results are reported in Table 8.

Discriminant function analysis on the TAIS variables revealed the percent contribution that each variable made to the overall significant between groups difference. The major contributing variables and their

Table 8

Means, Standard Deviations, and Analysis of Variance for Ability Levels with the Attentional Scales of the TAIS

Attentional Scale	Low Ability		High Ability		
	M	SD	M	SD	F
BET	19.29	2.68	22.88	3.44	19.2559*
OET	32.32	3.72	31.79	3.11	1.6625
BIT	25.88	2.65	27.50	3.39	5.3771*
OIT	23.91	4.06	22.29	4.09	3.3138
NAR	37.21	3.76	35.59	3.72	2.9597
RED	42.65	4.74	42.41	4.75	1.0197

*$p < .05$

respective contributions are reported in Table 9. The BET scale contributed 66.33%, followed by 18.18% from the NAR scale, and 9.58% from the OIT scale. Thus, these three scales contributed 94.29% of the total variance to the between ability groups difference.

Multivariate and Univariate Analysis of Variance and Discriminant Function Analysis for Success Levels with the Attentional Scales of the TAIS

A MANOVA for success levels (successful and unsuccessful) with the TAIS variables revealed significant overall group differences, θ (1, 2, 27.5) = .29, $p < .01$. The finding of a significant difference between groups led to the rejection of the fourth hypothesis that there would be no significant difference between the scores on the TAIS attentional scales for soccer athletes who regard themselves as successful and those who do not.

Separate ANOVA's for success levels with each of the variables of the TAIS revealed a significant ($p < .05$) group difference for only the BET and BIT scales. The successful group reported higher BET and BIT means than the less successful group. The results are reported in Table 10.

Discriminant function analysis on the TAIS variables revealed the percent contribution that each variable made to the significant between groups difference. The only meaningful contributor to the total variance for the success groups difference was the BET scale with a contribution of 96.13%.

Table 9

Discriminant Function Analysis on the Attentional Scales of the TAIS Contributing to Between Ability Groups Difference

Variable Ranking	Standardized Discriminant Weight	Percent of Contribution
1. BET	.81565	66.53
5. NAR	-.42636	18.18
4. OIT	-.30952	9.58
	Total	94.29

Table 10

Means, Standard Deviations, and Analysis of Variance for Success Levels with the Attentional Scales of the TAIS

Attentional Scale	Less Successful		Successful		
	M	SD	M	SD	F
BET	20.09	2.61	22.72	3.93	11.9192*
OET	32.22	4.82	30.56	6.08	1.3096
BIT	25.84	2.88	27.63	4.19	4.6565*
OIT	23.78	3.68	23.88	3.92	2.0894
NAR	37.31	3.86	35.94	4.13	1.9466
RED	42.72	5.03	40.81	5.01	2.1886

*$p < .05$

Multivariate Analysis of Variance for Experience Levels with the Attentional Scales of the TAIS

A MANOVA for experience levels (experienced and inexperienced) with the TAIS variables revealed no significant overall group differences, θ (1, 2, 31.5) = .09, $p > .05$. The finding of no significant difference between the groups led to the acceptance of the sixth hypothesis that there would be no significant difference between the scores on the TAIS attentional scales for soccer athletes who have considerable experience and those who have participated for only a few years.

Summary

Test-retest reliability was reported for the attentional scales of the TSAS and the TAIS, and also the ability and success scores of the PAQ. Coefficient alpha reliability was reported for the attentional scales of the TSAS and the TAIS.

As a result of a MANOVA for ability levels (high and low) with the TSAS variables, the first hypothesis, that there would be a significant difference between the scores on the TSAS attentional scales of the subjects in the high and low ability groups, was accepted. Further analysis showed that subjects in each ability group differed significantly on each of the six attentional scales, and also that three of the scales (BET, BIT, and NAR) contributed most of the variance to the ability group difference with the whole TSAS.

As a result of a MANOVA for success levels with the TSAS variables, the third hypothesis, that there would be a significant difference between the scores on the TSAS attentional scales of the subjects in the successful and unsuccessful groups, was accepted. Further analysis

showed that subjects in each success group differed significantly on each of the six attentional scales, and also that four of the scales (BET, OIT, OET, and RED) contributed most of the variance to the success group difference with the whole TSAS.

As a result of a MANOVA for experience levels with the TSAS variables, the fifth hypothesis, that there would be a significant difference between the scores on the TSAS attentional scales of the subjects in the experienced and relatively inexperienced groups, was rejected.

As a result of a MANOVA for ability levels with the TAIS variables, the second hypothesis, that there would be no significant difference between the scores on the TAIS attentional scales of the subjects in the high and low ability groups, was rejected. Further analysis showed that subjects in each ability group differed significantly on two of the attentional scales (BET and BIT), and also that three of the scales (BET, NAR, and OIT) contributed most of the variance to the ability groups difference with the whole TAIS.

As a result of a MANOVA for success levels with the TAIS variables, the fourth hypothesis, that there would be no significant difference between the scores on the TAIS attentional scales of the subjects in the successful and unsuccessful groups, was rejected. Further analysis showed that subjects in each success group differed significantly on two of the attentional scales (BET and BIT), and also that the BET scale contributed nearly all of the variance to the success groups difference with the whole TAIS.

As a result of a MANOVA for experience levels with the TAIS

variables, the sixth hypothesis, that there would be no significant difference between the scores on the TAIS attentional scales of the subjects in the experienced and relatively inexperienced groups, was accepted.

Chapter 5

DISCUSSION OF RESULTS

This chapter presents a discussion of the results reported in Chapter 4. Topics include the following: reliability of the test of soccer attentional style (TSAS), the Test of Attentional and Interpersonal Style (TAIS), and the personal assessment questionnaire (PAQ); ability level and attentional scores on the TSAS and the TAIS; success level and the attentional scores on the TSAS and the TAIS; experience level and the attentional scores on the TSAS and the TAIS; the attentional style of soccer athletes; and a summary.

Reliability of the TSAS, the TAIS, and the PAQ

The test-retest reliability coefficients for each of the six TSAS and TAIS attentional scales are reported in Table 1. These measures of response stability were gained from 23 subjects who retook the tests, 3-5 weeks following the first administration. The coefficients for the TSAS scales range between .92 for both the BET and OIT scales and .81 for the BIT scale, while the TAIS scales vary from .73 for the BIT scale to .36 for the NAR scale. Thus, the range of coefficients for the TSAS scales is .11 and .37 for the TAIS scales. The latter is due almost entirely to the low coefficient for the NAR scale. The TAIS scales would otherwise be within a previously reported test-retest reliability range for the TAIS scales of .60 to .93 (Nideffer, 1974).

Clearly the reliability coefficients from the TSAS scales are higher than from the TAIS scales. The TAIS items include a wide range of life situations many of which may have rather broad meaning.

Conversely the TSAS situations are all specific to the soccer environment and a more precisely defined behavioural competency. It seems possible, therefore, that the athletes found the soccer situations less ambiguous than many of the TAIS items which required some interpretation and which could also change more easily with time. If this was the case, then it may be that the NAR items on the TAIS appeared particularly vague to the subjects and this resulted in a low test-retest coefficient. Overall, then, the soccer athletes used in this study to gain test-retest reliability responded to the TSAS items more consistently after a 3-5 week interval than they did to the TAIS items.

The test-retest reliability for the PAQ is reported in Table 2. The ability coefficient (r = .72) and the success coefficient (r = .86) are both high enough to suggest that the PAQ used in the study has good consistency in the way the athletes responded to the bipolar adjective pairs following a 3-5 week interval. The success coefficient is similar to the test-retest reliability (r = .90) reported by Coulson and Cobb (1979) for the generalized expectancy of sport success scale from which the PAQ was adapted. The apparent difference between the ability and success coefficients may be due to a few reasons. Firstly, the athletes may have found it more difficult to consistently evaluate their own ability while previous success may be something that athletes have a clearer estimation of in their own minds. Secondly, the nature of the bipolar adjective pairs may have had some effect. The success pairs are largely adjectives describing personal feelings, whereas some of the ability adjective pairs require a comparison with others, such as the pair "better than most" and "worse than most." It would, therefore,

seem that the athletes were less certain about how they compared with others or were regarded by them than they were about their own satisfaction and success from the sport.

Coefficient alpha reliabilities for the attentional scales of the TSAS and the TAIS are reported in Table 3. Cronbach's alpha (Cronbach, 1951), the coefficient of equivalence, is used to determine the internal consistency of the variables of a test. Those attentional scales of the TSAS and TAIS with high alpha levels contain items which were answered in a homogeneous manner. The alpha reliability for the TSAS scales ranged from .83 for the BIT scale to .67 for the NAR scale, while the TAIS scales ranged from .70 for the BET and OIT scales to a low of .27 for the NAR scale. Thus, the range of alpha for the TSAS scales was .16 and .43 for the TAIS scales. Once again, the low alpha for the NAR scale is largely responsible for the greater range amongst the TAIS variables.

All the TSAS scales have greater alpha coefficients than their TAIS counterparts. The lower degree of internal consistency for the TAIS scales may possibly be explained by the greater need for individual interpretation of the TAIS items, causing variation in response to conceptually similar situations. The wide range of life situations included in the TAIS may also have led to response inconsistency. If this was so, then it would appear that attentional behaviour may not be generalisable enough to be consistent in a variety of life situations.

An items analysis of which situations, if removed from a particular scale, would have some meaningful effect on the coefficient for the whole scale was derived from the SPSS Reliability programme. Some interesting points may be drawn from these analyses, with special

reference to the somewhat isolated TAIS scales with a low alpha. The removal of item 27 (see Appendix B) from the BIT scale would increase alpha from .49 to .62 and item 51 from the RED scale would increase the coefficient from .49 to .55. Similarly the removal of item 28 from the NAR scale would increase alpha from .27 to .39. The effect of removing these items from the TAIS scales may well increase alpha to a level more consistent with the TSAS scales. It would be highly speculative to suggest why these items were responded to inconsistently from the other items of the respective scales, but removal of these few situations would have a considerable effect on the measures of internal consistency for the TAIS scales.

While the removal of an item from the NAR scale for the TAIS may well have increased the internal consistency of this scale, it may be important to note that the NAR scale appears also to have the lowest alpha reliability for the TSAS. From this it may be suggested that these items of the NAR scale, even in the soccer environment, require greater individual interpretation, or that the NAR scale items are based on a broader range of conceptualisations than other scales. Indeed, the NAR scale refers to both an effective narrow internal and external focus, and it seems possible that individuals do not necessarily have a tendency towards both a narrow internal and an external focus. For example, persons may be effective in narrowing their focus of attention on certain external cues, but they are unable to develop or maintain a focus on individual thoughts when it would be appropriate to do so. There may well be a need for two scales reflecting a narrow internal and a narrow external focus of attention, although the RED

scale, with an equally broad conceptual base, would appear to have internal consistency compatible with the other scales.

Ability Level and Attentional Scores of the TSAS and the TAIS

MANOVA with the TSAS attentional variables revealed significant differences between the subjects of high ability and those of low ability, θ (1, 2, 29.5) = .68, $p < .01$. Similarly significant group differences, θ (1, 2, 29.5) = .42, $p < .01$, were revealed with the TAIS variables. While these results led to the acceptance of the first hypothesis, the finding of a significant difference between ability groups (high and low) with the TAIS led to the rejection of the second hypothesis. In other words there was a significant difference between the scores on both the TSAS and the TAIS attentional scales for soccer athletes who regard themselves to be of high ability and those of low ability.

The traditional methodology used to relate measures of attention to the level of sport performance has offered inconclusive results. Barrell and Trippe (1975) failed to find significant differences between highly skilled and less skilled soccer players using a measure of field dependency, though highly skilled and less skilled tennis players were significantly different. Petrakis (1979) and Williams (1975) both reported no significant differences between high and low ability groups in the sports of tennis and fencing respectively. However, there is no reason to believe that the attentional demands of sports as diverse as fencing and tennis or as varied as the task demands within soccer can be related to the attentional behaviour requirements of one simple laboratory test designed to measure field dependency.

In recent years psychologists have largely adopted a new

methodology that relates to behaviour in specific extralaboratory environments, while the trait paradigm and the generalisability of psychological behaviour across many situations has been increasingly questioned. Sport psychologists have also followed in an attempt to identify and explain behaviour in terms of the psychological variables that are inherent in sport. Rushall (1975) and others have claimed that this approach has improved predictive validity for the tests designed to assess various psychological variables. However, Nideffer (1976b) has been alone in the situational assessment of attentional behaviour with his Test of Attentional and Interpersonal Style (TAIS). Although Nideffer (1976b) recognises the need for assessment devices to be as situation specific as possible if a psychological variable and behaviour are to be examined in a particular setting, the TAIS has been employed in a largely contradictory manner. The attentional competencies of various selective groups, from policemen to swimmers, gained from the broad range of life situations contained in the TAIS, have been extended to predict how these individuals will perform in their distinct environments. The question of how specific situations must be to gain an adequate assessment of behaviour in particular environments has therefore been raised. Are generalisable attentional competencies in a variety of common life situations also reflected in any specific cluster of situations, such as the soccer environment?

The results of this study suggest that both the TSAS, with soccer specific situations, and the TAIS, with a broad range of life situations, are able to reveal significant differences ($p < .01$) in measures of attentional behaviour between those soccer athletes who regarded

themselves to be of high ability and those of low ability. It would appear that the attentional constructs of the TAIS, despite being represented by a broad range of life situations, are generalisable to behaviour and performance in the soccer environment, therefore suggesting some predictive value. This is in agreement with Nideffer's (1976b) claims that the TAIS holds some predictive validity for behaviour in specific environments. Both tests also seem to provide empirical support for the importance of attentional capabilities in soccer performance.

ANOVA's for ability levels with each of the six variables of both the TSAS and the TAIS found dissimilarities between the two tests. While a significant ability group difference ($p < .05$) was revealed for each of the six variables of the TSAS (Table 4), only the BET and BIT scales of the TAIS (Table 8) revealed any significant difference ($p < .05$) between high and low ability groups. In other words the attentional constructs used to categorise all the six variables or scales seem appropriate to discriminate between high and low ability athletes when they are represented by the soccer situations of the TSAS. However, only the attentional constructs of the BET and BIT scales seem capable of discriminating between high and low soccer ability when they are illustrated by the life situations of the TAIS. The BET scale relates to a broad external focus of attention and the BIT scale to a broad internal focus. These results from the TAIS suggest that the group of soccer athletes who regarded themselves to be of high ability had a significantly greater capacity to develop and maintain both a broad external and internal focus than those who

regarded themselves to be of lower ability. These two attentional capabilities would therefore seem to be particularly meaningful for a skilled performer in contrast to a less skilled performer.

Discriminant function analysis on the TSAS variables (Table 5) revealed that the BET, BIT, and NAR scales contributed 95.55% of the variance in the ability groups difference with the whole TSAS. This further substantiates the importance of both the broad external and internal focus capabilities for the soccer athlete, while effectively narrowing the focus would also seem to be a particularly virtuous attentional behaviour of the skillful performer. It is interesting to note that these three scales represent effective types of attentional behaviour. In other words the attentional scales differences between the high and low ability groups was almost entirely attributable to the superior effective attentional behaviour of the high ability group, rather than notable ineffective attentional behaviour differences. Discriminant function analysis on the TAIS variables (Table 9) found that the BET and NAR scales contributed much of the variance (84.71%) in the ability groups difference with the whole TAIS, though the BIT scale, perhaps surprisingly, contributed little. While the BIT scale was individually capable of discriminating between high and low ability subjects, it did not meaningfully contribute to the variance in the ability groups difference with the whole TAIS. Any comments regarding the NAR scale should be made with caution since both test-retest and alpha reliability coefficients were low for this variable.

Success Level and Attentional Scores of the TSAS and the TAIS

MANOVA with the TSAS attentional variables revealed significant differences between the successful and less successful groups of athletes. θ (1, 2, 27.5) = .50, $p < .01$. Similarly significant group differences, θ (1, 2, 27.5) = .29, $p < .01$, were revealed with the TAIS attentional variables. While these results led to the acceptance of the third hypothesis, the finding of a significant difference between successful and less successful groups with the TAIS variables led to the rejection of the fourth hypothesis. In other words there was a significant difference between the scores on both the TSAS and the TAIS attentional scales for soccer athletes who regarded themselves as successful and relatively less successful.

While ability and success are separate constructs on the personal assessment questionnaire, the two are often complementary in sport and we may possibly expect similar differences in the scores on the attentional variables between those of high and low ability, and between successful and less successful subjects. Coulson and Cobb (1979) used a generalized expectancy of sport success scale to gain measures of how successful athletes expected to be in sport generally. They reported that the group means for varsity, junior varsity, and club sport participants were significantly higher than those for intramural, informal and non participants. In other words a measure of success would seem to be closely related to athletic ability.

The results of the present study suggest that both the TSAS, with soccer specific situations, and the TAIS, with a broad range of life situations, were able to reveal significantly different ($p < .01$)

measures of attentional behaviour between soccer athletes who regarded themselves as successful and those who did not. Once again this supports Nideffer's (1976b) claim that the TAIS holds some predictive validity for behaviour in specific environments. Both tests also seem to provide some empirical support for the importance of attentional capabilities in the achievement of success in soccer.

ANOVA's for success levels with each of the six variables of both the TSAS and the TAIS found dissimilarities between the two tests. While a significant success group difference ($p < .05$) was revealed for each of the six variables of the TSAS (Table 6), only the BET and BIT scales of the TAIS (Table 10) revealed any significant difference ($p < .05$) between successful and less successful groups. These results duplicate the ANOVA's for ability levels. The six attentional variables as illustrated by soccer situations all appear important in the achievement of success in soccer. However, only the attentional competencies illustrated by the TAIS items of the BET and BIT scales found differences between the successful and less successful groups of soccer athletes. These results suggest that the group of soccer athletes who regarded themselves as successful had a significantly greater capacity to develop and maintain both a broad external and internal focus than those who regarded themselves to be less successful. The fact that the other scales failed to reveal such differences between the success groups, suggests that these two attentional capabilities would seem to be particularly meaningful in the achievement of success in soccer.

Discriminant function analysis on the TSAS variables (Table 7)

revealed that the BET scale contributed 40.63% of the variance in the success groups difference with the whole TSAS. The three ineffective scales (OIT, OET, and RED) contributed 51.99% of the variance. In other words slightly over half the variance in the success groups difference was attributable to the greater attentional incompetencies or ineffectiveness of the less successful group, while the remaining variance was due to the superior attentional behaviour of the successful group on the BET scale items. These results are distinctly different from the discriminant function analysis on the TAIS variables for the ability groups difference and further comment will be found later.

Discriminant function analysis on the TAIS variables revealed that the BET scale contributed 96.13% of the variance in the success groups difference with the whole TAIS. In other words much of the difference between the success groups with the whole TAIS was attributable to the six items of the BET scale.

Experience Level and Attentional Scores of the TSAS and the TAIS

MANOVA with the TSAS attentional variables revealed no significant differences between the group of athletes with considerable experience and the group with least experience, θ (1, 2, 31.5) = .16, $p > .05$. Similarly no significant group differences were revealed with the TAIS attentional variables, θ (1, 2, 31.5) = .09, $p > .05$. These results led to rejection of the fifth hypothesis and the acceptance of the sixth hypothesis. In other words, there was no significant difference between the attentional scores on both the TSAS and the TAIS scales for soccer athletes who had considerable experience and those who had participated for only a few years.

Sporting ability would be regarded by many to be a direct function of the amount of playing experience that the individual has gained. The number of years that an athlete has had to practice and be involved in a sport would appear to be fairly closely associated with ability level. Therefore we might have expected that the differences in attentional behaviour of high and low ability and experienced and relatively inexperienced may be somewhat similar. However, the results do not support this premise. There was no significant difference in attentional behaviour, as measured by the TSAS and the TAIS attentional scales, between experienced and inexperienced soccer athletes.

The Attentional Style of Soccer Athletes

Attention was originally considered by psychologists as a predictable type of psychological behaviour that an individual would exhibit across many situations. Various dimensions of attention were recognised and measured by simple laboratory tests. Attempts were then made to relate these measures to behaviour in a range of environments, including sport. A person's particular attentional traits, as measured by conceptually rather broad tests, were combined to bestow the individual with a cognitive or perceptual style. Recently a more appropriate term has been utilised, namely attentional style. The contemporary approach to the evaluation of psychological variables involves the presentation of situations to gain responses regarding the individual's psychological behaviour in particular settings.

Nideffer (1976b) has been the only researcher to investigate attentional behaviour using this new methodology. Based upon six attentional constructs, a broad external focus (BET), an overloaded

external focus (OET), a broad internal focus (BIT), an overloaded internal focus (OIT), a narrow effective focus (NAR), and an underinclusive focus (RED), Nideffer (1976b) assembled 52 life situations to form the attentional part of the Test of Attentional and Interpersonal Style. He uses the term attentional style in reference to the combined attentional behaviour that an individual or group will tend to exhibit. Nideffer also suggests that an attentional style derived from the life situations of the TAIS scales will tend to be exhibited in specific environments such as sport, thus adopting a quasi-trait approach.

The results of this study from the TAIS suggest that the attentional styles for high and low ability, and successful and less successful soccer athletes are significantly different. This supports Nideffer's claim that attentional styles in life situations are also found in specific environments. Analysis of which TAIS scales contributed to the differences between each ability and success groups revealed that the broad external focus (BET) contributed much of the variance in both cases. The only major difference between the two ability and success groups was that high ability and successful subjects reported a greater capacity to broadly focus attention externally. An examination of the attentional demands of soccer makes this fairly easy to comprehend. In a continuously moving team sport, with cues arising all around the participant, it would seem a necessity to be almost spontaneously aware of this information. Those who do not have a tendency to be receptive to concurrent cues in a rapidly changing environment are likely to miss information essential for reacting as quickly as possible.

ANOVA's for ability and success levels with the TAIS revealed

significant differences between the BET scores for the upper and lower levels, and also for the BIT scale. In other words, the high ability and successful subjects also reported a greater capacity to develop and maintain a broad internal focus. The ability to synthesize experience and environmental cues in order to plan ahead would seem imperative for success and ability in soccer as these results suggest. This follows from Cratty's (1973) suggestion that it is frequently necessary for an athlete to work out all possibilities for viable game strategies (divergent thinking) before deciding upon the best alternative (convergent thinking). The ability to analyse team interactions or opponents' skills and weaknesses would also seem relevant to soccer performance. Therefore, it would appear congruent that the ability and success of a soccer athlete would rest particularly upon an effective broad focus, and also on a broad internal focus of attention to some extent.

Nideffer (1976b) suggested that assessment devices be as situation specific as possible if a psychological variable and behaviour are to be examined in a particular setting. We may therefore expect a more complete picture of the attentional style of soccer athletes from the soccer specific situations of the TSAS. Having found that the whole TAIS differentiated the attentional styles of high and low ability, and successful and less successful soccer athletes, it is not surprising to find that the whole TSAS revealed corresponding differences. Indeed, there were significant differences between high and low ability, and successful and less successful groups, on each of the six attentional scales. In other words, there was a substantial difference between

the attentional style of high ability and successful athletes and low ability and less successful athletes. The upper ability and success groups had a more effective focus of attention (with high scores on the BET, BIT, and NAR scales), and a less ineffective focus (with lower scores on the OET, OIT, and RED scales). The demand for an effective broad external and internal focus in soccer has been discussed. The third effective type of focus also seems important. The ability to focus on few thoughts or selective cues in the environment is frequently demanded in soccer. It seems that an individual who is able to do this, at a compelling moment, is at an advantage. With higher scores on the BET, BIT, and NAR scales than the low ability and less successful subject, the upper ability and success groups may be referred to as possessing a superior "flip-flop" mechanism. In other words, while they are more capable of developing a broad external focus, they are also more able to develop a broad internal focus and a narrow internal and external focus of attention. The ability to switch from a broad to a narrow focus and from an external to an internal focus would seem highly desirable in a fast moving sport like soccer. These results suggest that the high ability and successful groups were more capable of this than the low ability and less successful groups.

It may seem reasonable to suggest that performance in soccer would deteriorate if athletes are unable to process the large volume of information available to them in a fast moving game. The higher scores on the OET scale would seem to indicate that the low ability and less successful subjects attempt to process too much information and become overloaded by external cues. In other words, if the low ability

and less successful athletes tried to process an increased volume of environmental cues on par with the high ability and successful athletes, they may quite likely become unable to contend with all the information present. Similarly, performance may deteriorate if an athlete attempts to think about too many things at the same time. While it appears that the low ability and less successful athlete tends to focus on fewer thoughts and feelings at one time than the high ability and successful athlete, an attempt to increase this capacity would probably lead to confusion. The athlete would be unable to contend with an increased number of thoughts and feelings and would tend to overload and be incapable of making decisions effectively.

While soccer frequently requires the ability to maintain a broad external and internal focus, there are also times when a narrow external or internal focus is appropriate. The results of this study, from the TSAS, show that high ability and successful groups seem more capable of narrowing their focus of attention to either selective environmental cues or single thoughts, without being distracted by other thoughts, feelings, or irrelevant cues. In contrast, the low ability and less successful groups reported a tendency to narrow their focus at inappropriate moments or to such an extent that it becomes inappropriate, in comparison to the high ability and successful groups.

Nideffer (1976a) suggested that anxiety is commonly associated with an underinclusive focus of attention. Uncontrolled anxiety and arousal has the effect of narrowing the attentional focus to the extent that it may be ineffective in some situations. The fact that the low ability and less successful groups had a greater tendency to be underinclusive

may suggest that these individuals perceive certain situations in soccer as more stressful than the high ability and more successful athletes, or that they are unable to control their anxiety. However, no significant differences were found between the two levels of ability and success with the RED attentional scale of the TAIS. This suggests that if anxiety is a key factor in the score on this scale then the athletes were able to relate to the stressful soccer situations, but not to the more general stressful life situations presented in the TAIS. The inability to control anxiety, on the part of the low ability and less successful groups, may also be advanced to explain why these subjects recorded lower BET and BIT scores. Since their scores on these two scales on the TAIS were also significantly lower it may be speculated that the low ability and less successful groups have a higher level of trait anxiety, across the broad range of life situations and the soccer environment. We are, however, unable to identify how much competitive trait anxiety in the soccer situations contributed to the difference in attentional styles between the two ability and success groups, other than noting its possible influence on the underinclusive focus of attention in the soccer situations.

Analysis of which scales contributed to the difference between high and low ability groups for the whole TSAS revealed that 95.55% of the variance was attributable to the three effective scales (BET, BIT, and NAR). In contrast, an analysis of which variables contributed to the difference between successful and less successful groups for the whole TSAS revealed that 51.99% of the variance was attributable to the three ineffective scales. In other words, ability groups differed largely

due to the high ability group's superior effective attentional behaviour, while the success groups differed due to this and also the more ineffective attentional behaviour of the less successful group. With considerable speculation it may be suggested that both high and low ability athletes tend to make errors due to ineffective or inappropriate attentional focus but that the high ability athletes are particularly distinguished by their superior ability to develop and maintain a broad external and internal focus and also a narrow external or internal focus of attention. The successful in contrast to the less successful soccer athlete would seem to make fewer errors due to attentional ineffectiveness and also perform at a higher level due to a more effective attentional behaviour.

While significant differences were revealed between the high and low ability groups and between the successful and less successful groups, with both TSAS and TAIS, there was no significant difference in the attentional behaviour of experienced and relatively inexperienced soccer athletes. Since we would anticipate ability to be closely related to the amount of playing experience this may seem somewhat surprising. Experienced athletes should tend to be of high ability while those who have participated for only a few years may tend to be of lower ability. However since this does not appear to be the case from the results of this study, an alternative explanation may be appropriate. It would appear that the attentional abilities of the soccer athlete do not improve merely with experience. Therefore, one may possibly infer that these are innate psychological qualities to some extent, which an individual will tend to exhibit throughout an athletic career, changing

little with experience. While attentional abilities may be innate, in that they would appear to change little with experience, there may well be some room for improvement in the control of attentional focusing. Coaches and athletes in sports such as soccer recognise the need for practice and experience to improve performance. However much of this is directed towards ball skills and predetermined tactics with little concern for psychological capacities such as attentional behaviour. The belief that the latter qualities develop naturally with experience may now be questioned. The finding that the attentional constructs of the TAIS and TSAS, devised by Nideffer (1976b), differentiated high and low ability, and also successful and less successful soccer athletes, would seem to add support to the importance of attentional behaviour in soccer performance. Nideffer (1979) has also suggested that improved control of attentional processes has direct results in the control of anxiety and arousal. This is important since anxiety and arousal frequently have debilitating effects on sport performance. It may, therefore, seem logical that some consideration be made in training and practice sessions for improvement in the control of attentional abilities such as broadening or narrowing attentional focus in particular situations.

Summary

Adequate test-retest reliability and Cronbach's alpha reliability (for internal consistency) was revealed for all the attentional scales of the test of soccer attentional style (TSAS) and the Test of Attentional and Interpersonal Style (TAIS), though the NAR scale on the TAIS was low. The TSAS scales on both measures of reliability were higher than their

TAIS counterpart scales. Test-retest reliability for ability and success measures on the personal assessment questionnaire was also adequate.

MANOVA with both the TSAS and the TAIS attentional variables revealed significant differences between the high and low ability groups. The first hypothesis that there would be a significant difference between the scores on the TSAS attentional scales for soccer athletes who regard themselves to be of high ability and those of low ability, was accepted. The second hypothesis that there would be no significant difference between the ability groups with TAIS scales was rejected. The results were discussed in the light of previous attempts to relate attentional behaviour to ability in sport, and the contemporary assessment of psychological variables. The importance of each scale was also discussed from the results of ANOVA's and discriminant function analyses for ability levels with the TSAS and the TAIS.

MANOVA with both the TSAS and the TAIS attentional variables revealed significant differences between the successful and less successful groups. The third hypothesis that there would be a significant difference between the scores on the TSAS attentional scales for soccer athletes who regard themselves to be successful and less successful, was accepted. The fourth hypothesis that there would be no significant difference between the success groups with the TAIS scales was rejected. The importance of each attentional scale was also discussed from the results of ANOVA's and discriminant function analyses for success levels with the TSAS and the TAIS.

MANOVA with both the TSAS and the TAIS attentional variables revealed no significant difference between the experienced and

inexperienced groups. The fifth hypothesis that there would be a significant difference between the scores on the TSAS attentional scales for soccer athletes who have considerable experience and those who have participated for only a few years, was rejected. The sixth hypothesis that there would be no significant difference between experienced and relatively inexperienced groups with the TAIS scales was accepted. This was discussed with reference to the association between experience and ability in sport.

The final section considered the attentional style of soccer athletes. This included a reference to the evolution of the term attentional style and how its present meaning relates to the soccer athlete. The differences in attentional style, derived from the TAIS and the TSAS scales, between high and low ability and between successful and less successful soccer athletes, were discussed. The finding of no significant difference between experienced and inexperienced subjects was also discussed. In conclusion it was noted that soccer athletes may well benefit from some form of training that considers the ability to control attentional processes, rather than relying on apparently insignificant, incidental learning of attentional behaviour.

Chapter 6

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

It was the intention of this study to construct a test of soccer attentional style (TSAS) and administer it, together with a Test of Attentional and Interpersonal Style (TAIS) designed by Nideffer (1976b). A personal assessment questionnaire (PAQ) was also developed to gain self-report measures of ability, success, and experience in soccer. Once established, the data gained from the three instruments were employed to examine the capabilities of the TSAS and the TAIS to differentiate the attentional style of soccer athletes on the basis of ability, success, and experience in soccer.

The subjects involved in the study (n = 104) were varsity and junior varsity soccer athletes from eight Central New York State colleges and universities. To gain measures of reliability for the testing instruments, 23 subjects from Ithaca College were retested 3-5 weeks following the first administration.

The first 74 statements of the TAIS were employed, relating to attentional behaviour in a range of life situations, while the TSAS consisted of 78 randomly listed statements relating specifically to situations encountered in soccer. The TSAS situations were intuitively written and selected with the assistance of several soccer coaches and players. This was done on the basis of which situations seemed most tangible to the soccer athlete either through direct or vicarious experience while covering the whole spectrum of the game (other than

goalkeeping). Each situation of the TSAS represented one of six attentional scales recognised and utilised by Nideffer (1976b) in the construction of the TAIS. These include a broad external focus (BET), overloaded external focus (OET), broad internal focus (BIT), overloaded internal focus (OIT), narrow effective focus (NAR), and underinclusive focus (RED).

Subjects rated items on the TAIS and the TSAS for the frequency of their occurrence on a 5-point continuum ranging from "never" to "always," using markread computer cards to record their answers. The PAQ was constructed to gain measures of success and ability in soccer, using a semantic differential technique with a 5-point scale. Subjects were required to respond to the statement "in soccer I have been," on six bipolar adjective scales describing success, and to "my soccer ability is," on nine bipolar adjective scales. Space was also provided on the questionnaire to record the number of years of involvement in competitive soccer.

Adequate test-retest reliability was revealed for the attentional scales of the TSAS and the TAIS, although the NAR scale coefficient on the latter was lower than the other TAIS scales. The reliability coefficients of all the six TAIS scales were lower than their counterparts on the TSAS. The coefficient alpha reliabilities showed a similar difference between the TSAS and the TAIS attentional scales, and all appeared adequate apart from the low NAR scale of the TAIS. Adequate test-retest reliability was reported for the measures of success and ability from the PAQ.

The subjects were ranked according to their ability, success, and

experience scores. Approximately the top and bottom third subjects on each ranking were labelled as high and low ability, successful and less successful, and experienced and less experienced, respectively. Six separate multivariate analyses of variance were performed to test the hypotheses.

The first hypothesis that there would be a significant difference between the scores on the TSAS attentional scales for soccer athletes who regarded themselves to be of high ability and low ability was accepted. The second hypothesis that there would be no significant difference between the scores on the TAIS attentional scales for the ability groups was rejected. The third hypothesis that there would be a significant difference between the scores on the TSAS attentional scales for soccer athletes who regarded themselves as successful and less successful was accepted. The fourth hypothesis that there would be no significant difference between the scores on the TAIS attentional scales for the success groups was rejected. The fifth hypothesis that there would be a significant difference between the scores on the TSAS scales for soccer athletes with considerable experience and those with less experience was rejected. The sixth hypothesis that there would be no significant difference between scores on the TAIS attentional scales for the experience groups was accepted.

Where significant differences were revealed, analyses of variance determined which attentional scales were able to discriminate ability or success groups. All six TSAS scales were able to differentiate ability and success groups, while both the BET and BIT scales were the only TAIS variables able to differentiate ability and success groups.

Discriminant function analysis was employed to determine which attentional variables contributed significantly to the ability and success groups difference with the whole TSAS and the TAIS. The three TSAS effective scales (BET, BIT, and NAR) contributed 95.55% of the variance to the ability groups difference, while the TAIS BET scale contributed 66.53%. The BET scale was also found to be important in the success groups difference. The TSAS BET scale contributed 40.63%, while the three ineffective scales contributed a further 51.99% of the variance. The TAIS BET scale contributed 96.13% of the variance to the success groups difference.

It was concluded that while the TSAS and the TAIS attentional scales are capable of differentiating both high and low ability and successful and less successful soccer athletes, neither test is able to differentiate experienced and less experienced soccer athletes. In addition, each of the six attentional scales of the TSAS is able to differentiate high and low ability, and successful and less successful soccer athletes while only the BET and BIT scales of the TAIS are able to do so. Finally, the BET scale for both the TSAS and the TAIS represents the most important type of attentional behaviour in the differentiation of both high and low ability soccer athletes, and also successful and less successful participants.

Conclusions

The following conclusions were established from the findings presented in this study:

1. Both the test of soccer attentional style (TSAS) and the Test of Attentional and Interpersonal Style (TAIS) attentional scales are able

to differentiate soccer athletes of high and low ability, as determined from the personal assessment questionnaire (PAQ).

2. Each of the six TSAS attentional scales are able to differentiate soccer athletes of high and low ability, while only the broad external (BET) and the broad internal (BIT) scales of the TAIS are able to do so.

3. The BET scale for both the TSAS and the TAIS represents the most important type of attentional behaviour in the differentiation of high and low ability soccer athletes.

4. Both the TSAS and the TAIS attentional scales are able to differentiate soccer athletes who have been successful and less successful, as determined from the PAQ.

5. Each of the six TSAS attentional scales are able to differentiate successful and less successful soccer athletes, while only the BET and the BIT scales of the TAIS are able to do so.

6. The BET scale for both the TSAS and the TAIS represents the most important type of attentional behaviour in the differentiation of successful and less successful soccer athletes.

7. The TSAS and the TAIS attentional scales are unable to differentiate experienced and less experienced soccer athletes.

Recommendations

The following recommendations for further study are made after the completion of this investigation.

1. Tests of attentional style should be developed for other sport areas using appropriate situations to represent the six attentional scales used in this study.

2. The test of soccer attentional style should be administered in conjunction with tests designed to measure sport anxiety, to ascertain how anxiety and arousal affects the attentional style of soccer athletes.

3. A study should be conducted with the TSAS, but the NAR scale may be divided into a narrow external and a narrow internal focus of attention to examine the effects of each in differentiating ability and success levels.

4. A test of attentional style for other sport areas should be constructed and administered to athletes, in conjunction with measures of concentration time for specific situations in the sport.

5. The attentional scales of the Test of Attentional and Interpersonal Style should be administered to athletes in sports that appear to contrast in terms of their attentional demands.

6. A test of attentional style should be administered together with tests for visual perception and mental rehearsal.

Appendix A

TEST OF SOCCER ATTENTIONAL STYLE

INSTRUCTIONS

USE NO. 2 PENCIL. DO NOT WRITE ON THE TEST BOOKLET.

Read each item carefully and then answer according to the frequency with which it describes you or your sport behaviour. For example, item 1 is "I am in a tight situation with the ball and notice another player out of the corner of my eye. I assume he is on my side and pass, only to see that I have given the ball to an opponent."

A = NEVER

B = RARELY

C = SOMETIMES

D = FREQUENTLY

E = ALWAYS

If your answer to the first item is SOMETIMES, you would darken C on the answer card for item number 1. The same key is used for every item, thus each time you mark an A you are indicating NEVER, etc.

1. Please be sure to mark your name in the space provided at the top of the answer card.

2. Fill in your school's name in the space following "Course:" at the top of the answer card.

Appendix A (continued)

CARD # 1

1. I am in a tight situation with the ball and notice another player out of the corner of my eye. I assume he is on my side and pass, only to see that I have given the ball to an opponent.

2. The coach has instructed me to do something I disapprove of. My performance suffers, while I think about the instructions and my own feelings.

3. I talk or think to myself as I plan my next move. For example, " . . . if I pass to him, he can pass back to me there . . . ."

4. I have just been badly fouled. Now I see the responsible opponent with the ball and tackle him hard, giving away an unnecessary free kick.

5. I have just made an important mistake. My teammates assure me that it was not completely my fault, but I continue to think about the error and make more mistakes.

6. Faced with only the goalkeeper to beat I have to decide to chip or place the ball to the side past him. I fail to decide positively enough and shoot weakly at the goalkeeper.

7. I tend to give the ball away in a complex situation, or do something hurriedly or instinctively, rather than stopping to think.

8. I am instinctively aware of my position on the field, relative to other players, the field markings and goals.

9. When I am tired I tend to make a lot of mistakes and lose concentration on the game.

10. The game has just begun and the opposition is attacking strongly. I have difficulty in concentrating on all the players moving around me.

11. I have been sitting on the substitutes' bench for most of the game and have developed strong feelings against the coach. When finally called upon in the last 5 minutes I am unable to concentrate on the game.

12. I make more mistakes in a crowded penalty area than in other areas of the field where there are fewer players at any one time.

13. I see two uncovered teammates, one requiring a short pass, the other needing a longer pass. I give the ball away with neither a long nor short pass, unable to decide which to pass to.

14. I am surrounded by opponents, but still tend to find a free teammate to pass to.

15. There are moments when I am not aware of where my teammates are during a game.

Appendix A (continued)

16. While the coach shouts to me during a game my performance declines as I try to listen to the instructions..

17. I notice a teammate in a good position and continue to try to pass to him, ignoring another player in a better position.

18. I have just been strongly warned by an official. I play less competitively as the thoughts of being sent off the field continually distract me.

19. I would rather play in a one-on-one situation than when more players are involved and I have to be aware of many more possibilities.

20. I am in a defensive wall in front of goal. When a shot at goal comes I instinctively tense up to protect myself, perhaps leaving a gap in the wall.

21. I see two teammates both unmarked and unable to make a decision which to pass to, I pass to a point placed between the both of them.

22. When I am actually playing, I am almost totally unaware of the spectators.

23. I remember previous errors and quickly make appropriate adjustments, in terms of my position on the field for example.

24. In important games excessive pressure to do well causes me to make mistakes, particularly at the beginning.

25. The playing area is very muddy or it is very cold and raining hard. My mind is on the hot showers after the game.

26. I can observe the situation and think ahead.

27. An opponent is about to dribble past me. I remember which side he usually takes the ball and I am able to anticipate his move and tackle the opponent when he tries to dribble in that direction.

28. I remember social or personal problems during a game.

29. My friends are watching and I set out to impress them with a long dribble.

30. I am faced with an advancing goalkeeper in a one-on-one situation. I decided whether to shoot or dribble past the goalkeeper and concentrate closely on my plan.

31. During a game my mind seems "blank" and many of my actions lack purpose.

32. I can quickly recognise other's mistakes and make up for them.

Appendix A (continued)

33. I get lost in the game so intensely that I am not aware of the coach or captain shouting instructions while I play.

34. I can anticipate certain moves and often make interceptions.

35. I have just scored or done something exceptional. I sit back on my performance, with the feeling that I have earned my place on the team for the rest of the match and the next game.

36. A teammate has just strongly complained to me after I failed to pass to him in a good position. I receive the ball again and make an extra effort to pass to him but this time he is tightly covered and I give the ball away unnecessarily.

37. I have been fouled but the referee waves the play on. I immediately run after the official and continue to complain, forgetting the game.

38. I make an important mistake, but quickly remove distracting negative feelings.

39. I get very frustrated when a teammate is performing poorly.

40. I lose possession of the ball when I could have passed to several teammates all calling for the ball and in good positions.

41. My performance deteriorates considerably on a bumpy field.

42. It is equally easy for me to concentrate against less skilled and more skilled opponents.

43. While playing I am constantly analyzing the game.

44. When I am performing I "coach" myself mentally with instructions.

45. I am about to receive a pass. An opposing player, waiting right behind me, nearly broke my leg in a similar situation, only 1 minute earlier. I fail to control the ball.

46. When teammates complain that I should have passed to them I reply honestly that I never saw or heard them.

47. I can usually stay "up" and confident even through one of my poorer performances.

48. If my performance has begun poorly, I am able to forget about that and concentrate on the game.

Appendix A (continued)

49. I am faced with an advancing goalkeeper in a one-on-one situation. I decide to chip the ball over the goalkeeper, but he advances too quickly and I fail to change my plan and chip hopelessly into the goalkeeper's arms.

50. I would describe myself as a constructive player, recognizing obscure openings and making "intelligent" use of the ball.

51. It is equally easy for me to concentrate when playing either at home or away.

52. When playing away from home I may be distracted by the new surroundings particularly just before the game and early in the match.

53. I make an important mistake, but am not affected by the error as I continue to be involved in the game.

54. I am easily beaten in two-on-one situations because I can't take in all the information and tend to rush in without stopping to think.

55. In important games excessive pressure to do well may lead me to do things hastily without slowing down to think.

56. Time is rapidly running out for my team to tie the game. I begin to do desperate things, such as shooting from too far out or trying to dribble through the whole opposing team.

57. I am aware of how moves are developing around me.

58. I am worried about playing against a superior team or against a much better player.

59. I am in the act of shooting when an opponent shouts or waves his arms in an attempt to put me off. I am distracted by this.

60. I tend to lose concentration just before half-time.

61. I seem to be constantly aware of where the boundaries of the field and goals are without always checking first.

62. I am constantly aware of where the opposition are during a game.

63. When I make a mistake, I have trouble forgetting it and concentrating on my ongoing performance.

64. I am about to shoot when I see or hear a teammate in a slightly poorer scoring position. I am distracted by this.

Appendix A (continued)

CARD # 2

1. I am accused of "ball watching" by the coach.

2. I pass to players in off-side positions without thinking.

3. I see a situation and recall a move practiced previously or suggested by the coach, and begin to put it into operation.

4. I tend to put my head down and run into tight situations with little teammate support.

5. I am supposed to cover an opponent. I am tempted to follow the ball, leaving my own man free.

6. I am in a one-on-one situation against the goalkeeper, but a defender approaching from behind distracts me and I shoot hurriedly, badly missing the opportunity to score.

7. I have the ball in a three-on-one situation but lose it easily as I fail to decide who to pass to and when.

8. When I am slightly injured and continue to play I tend to make a lot of mistakes and lose concentration on the game.

9. I am able to watch opposing players' movements and respond appropriately.

10. I put my head down and dribble, unaware of my teammates and opponents other than those immediately around me.

11. I lose the ball after failing to hear or see an opponent running up behind me.

12. A teammate calls for a pass. By the time I have passed he is covered and an opponent wins the ball easily.

13. I have just missed an easy chance to score and I am criticized by my teammates and coach. I get another easy chance a minute later but cannot concentrate and I miss the opportunity.

14. I consciously "talk to myself" while I am performing.

Appendix B

ITEM NUMBERS FOR EACH TSAS ATTENTIONAL SCALE

Attentional Scale	Item Number
BET	14, 15, 32, 33, 46, 50, 57, 61, 62, 68, 73, 74, 75.
OET	1, 6, 7, 12, 13, 16, 19, 21, 40, 52, 54, 70, 71.
BIT	3, 8, 23, 26, 27, 34, 43, 44, 47, 48, 67, 78.
OIT	2, 4, 9, 11, 24, 28, 36, 45, 55, 56, 58, 60, 72, 77.
NAR	20, 22, 30, 38, 41, 42, 51, 53, 59, 64, 69.
RED	5, 10, 17, 18, 25, 29, 31, 35, 37, 39, 49, 63, 65, 66, 76.

Appendix C

PERSONAL ASSESSMENT QUESTIONNAIRE-FORM S

Name:_____

Institution:_____

Years Playing Experience:_____
(high school) (college) (other)

Please mark X in the space that best represents your personal assessment of the statements. Example: If you have always been on winning soccer teams, mark X in the left hand space; if you have been on as many winning as losing soccer teams, mark X in the middle space.

In Soccer I have been

on winning teams	_ _ _ _ _	on losing teams
unnoticed	_ _ _ _ _	recognised
successful	_ _ _ _ _	unsuccessful
frustrated	_ _ _ _ _	rewarded
happy	_ _ _ _ _	sad
uncertain	_ _ _ _ _	confident

My Soccer Athletic Ability is

above average	_ _ _ _ _	below average
bad	_ _ _ _ _	good
ridiculed by coach	_ _ _ _ _	praised by coach
superior	_ _ _ _ _	inferior
limited	_ _ _ _ _	broad
praised by others	_ _ _ _ _	ridiculed by others
encouraging	_ _ _ _ _	frustating
strong	_ _ _ _ _	weak
worse than most	_ _ _ _ _	better than most

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