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Attentional style of volleyball athletes

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ATTENTIONAL STYLE OF VOLLEYBALL ATHLETES

by

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An Abstract

of a thesis submitted in partial fulfillment

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ABSTRACT

This study examined the effects of competitive trait anxiety, perceived anxiety, and perceived success on the attentional styles of college volleyball athletes (N = 45). Attention was measured using Nideffer's Test of Attentional Style (TAS) as a general measure of attention, and a test of volleyball attentional style (TVAS) as a sport-specific measure of attention. Competitive trait anxiety was assessed utilizing Martens' Sport Competition Anxiety Test (SCAT), and perceived ability and success with a personal assessment questionnaire (PAQ). Multivariate analysis of variance revealed that volleyball athletes who reported themselves to be low anxious, of high ability, and successful were significantly different in attentional style than athletes who were high anxious, of low ability, and less successful, as measured on both the TVAS and TAS. Discriminant function analysis revealed that ineffective attentional components captured the greatest percentage of overall variance, and that the TVAS more accurately identified athletes with ineffective attentional styles than the TAS. It was concluded that the sport-specific TVAS was more appropriate for identifying attentional behaviors (effective versus ineffective) among volleyball athletes than the general TAS.

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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
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September 1981

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

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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

Attention is a variable which is of growing importance among those associated with sports--athletes, coaches, and researchers. Suinn (1978) states that, in the actual process of competition, the active, conscious part of the mind which directs the body can only make a positive contribution to the performance process through regulation of attention.

What is attention, that it could occupy such a prominent place in successful athletic performance? A distinction should be made between two phases of attention as commonly discussed in the literature. "Visual attention" is a characteristic of perception involving physical processes such as vigilance, acuity, and scanning behavior (Kahneman, 1973). "Psychological attention," which is of major interest in this study, refers to the cognitive control processes which direct thought and senses to particular objects (Nideffer, 1976b; Suinn, 1978).

When specificity of exercise became a popular concept among motor learning researchers (e.g., Fleishman, 1972; Marteniuk, 1974), it heralded a new dawn in physical behavior research. After all, matching training to physical demands seemed only logical. Sport psychologists were a bit slower to recognize the significance of specificity of training to their discipline, however. Until recently, sport psychologists were interested in universal predictive tests--finding the common element that would allow performance predictions across a wide range of situations. The realization that psychological task demands were also situation-specific and required specific assessment tools was slow to arrive.

Nideffer (1976a), a clinical psychologist, formulated a theory of psychological attention based partly on his work with athletes. He developed

a test based on two dimensions of attention--width and direction--to measure attention across a broad range of life situations. According to Nideffer (1976a), attentional focus may vary along the width continuum from broad to narrow. Direction of attention may be either internal, focused on thoughts and emotions, or external, focused on environmental stimuli. These two dimensions work in combination. Thus, a person may exhibit broad external, broad internal, narrow external, or narrow internal attentional styles. Since in most instances a person can alter attention in either dimension at will, Nideffer's constructs fit well the specificity principle of matching task demands with appropriate attentional styles.

The nature of competitive sport is such that varying situations require certain types of attention if performance is to be optimized (Nideffer, 1976b). A football quarterback needs to maintain a broad external focus to select the proper option as a play develops. A basketball player on the foul line needs a much narrower focus of attention--concentration--to sink a freethrow. Attention control does not stand alone as a determiner of performance, however. Arousal and anxiety are major modifiers of attention (Landers, 1980). Anxiety and arousal narrow attention, preventing the athlete from processing many cues. If a narrow attentional style is appropriate for the task (e.g., swimming), then performance may improve under conditions of high arousal as long as the athlete avoids tunnel vision. On the other hand, attention narrowed by anxiety may prove disastrous to an athlete in a situation where a broad focus is essential for good performance (e.g., a guard reading a defense in basketball).

Because anxiety and attention interact in this manner, the potential arises to make dramatic changes in an athlete's performance by altering arousal levels and realizing the impact on attention. To accomplish this,

however, the specific demands for various sports--and demands within a sport--must be identified. A valid and reliable means of measuring an athlete's attentional style and anxiety level in common sport situations must also be delineated. Once task demands, individual attentional styles, and anxiety levels are identified, the athlete can alter anxiety to achieve athletic success. Indeed, the athlete of high ability, psychologically speaking, would be one who could select an attentional style and control anxiety to meet the situation demands of his/her sport.

Power volleyball is a fast-paced sport which requires exceptional jumping ability and quick reactions. The game is characterized by quick shifts in momentum--teams seem to earn or lose several points in succession, depending on their ability to maintain concentration in the face of skill demands, performance and judgment errors, and emotional play. The fine margin of error in volleyball movements frequently contributes to frustration and heightened anxiety during the game.

"Reading" the opponent's offense and defense is the critical perceptual processing aspect of volleyball that determines success (McManama, 1972). The width dimension of attention is very important in "reading," as the athlete initially focuses broadly in an effort to select the proper cues which allow the athlete to commit to a particular course of action. As options are eliminated, the athlete focuses more and more narrowly on cues that relate to specific pre-assigned defensive or offensive actions. Direction of attention is also important. Players are frequently internal during breaks in the action or prior to serving (when selecting a serving strategy), and external during the flow of the game.

Attention and anxiety seem intuitively to be closely related to volleyball ability and success. Thus, the relationships between attentional styles of

volleyball athletes and levels of anxiety, ability, and success will be examined in this study.

Scope of Problem

This study examined the effects of competitive trait anxiety, perceived ability, and perceived success on attentional styles of volleyball athletes. Subjects (N = 45) were female varsity college and USVBA "A" caliber or better players who were active volleyball athletes in New York State. Self-report measures were used to collect data for each variable.

Attention was measured using two assessment devices. The first 74 statements which form the attentional portion of Nideffer's (1976a) Test of Attentional and Interpersonal Style (TAIS), hereafter referred to as the Test of Attentional Style (TAS), was utilized. The TAS covers a broad range of general life situations, yet is still used to measure attentional behavior in specific situations, such as sports. A test of volleyball attentional style (TVAS) was constructed as an alternative assessment tool to provide a more specific measure of attentional behavior among volleyball athletes.

Competitive trait anxiety was measured with Martens' (1977) Sport Competition Anxiety Test (SCAT), and perceived ability and success with a personal assessment questionnaire (PAQ). Thirteen of the subjects were retested on all test instruments 4-6 weeks after initial testing to determine test-retest reliability.

Test-retest coefficients were calculated using the Pearson product-moment correlation, and internal consistency using Cronbach's (1951) coefficient alpha analysis. High and low group scores on the anxiety, ability, and success variables were analyzed for group differences using a multivariate analysis of variance (MANOVA) procedure. Follow-up tests included univariate analysis of

variance (ANOVA), and discriminant function analysis. Canonical correlation analyzed the multivariate relationship between anxiety, ability, and success as one set of variables and the TAS and TVAS, respectively, as the other set of variables.

Statement of Problem

The relationships between attentional styles of volleyball athletes and levels of competitive trait anxiety, perceived ability, and perceived success were examined in this study. Anxiety, ability, and success were identified as independent variables, while the six attentional scales of the TAS and TVAS served as multiple dependent variables. Data obtained from these measures were computed to answer the following questions:

1. Are there significant differences between high- and low-anxiety, ability, and success groups on the TAS?

2. Are there significant differences between high- and low-anxiety, ability, and success groups on the TVAS?

3. Can particular attentional styles be identified as effective or ineffective for female volleyball athletes?

Hypotheses

1. Volleyball athletes who report themselves to be low anxious will exhibit a significantly different attentional style as measured on the TVAS than those who are high anxious.

2. Volleyball athletes who report themselves to be of high ability will exhibit a significantly different attentional style as measured on the TVAS than those of low ability.

3. Volleyball athletes who report themselves to be successful will exhibit a significantly different attentional style as measured on the TVAS than those who are less successful.

4. Volleyball athletes who report themselves to be low anxious will show no difference in attentional style as measured on the TAS than those who are high anxious.

5. Volleyball athletes who report themselves to be of high ability will show no difference in attentional style as measured on the TAS than those who are of low ability.

6. Volleyball athletes who report themselves to be successful will show no difference in attentional style as measured on the TAS than those who are less successful.

Assumptions of Study

1. The athletes were of sufficient level of experience to relate to the situations presented in the TVAS.

2. Possible position specialization among athletes would not affect their ability to relate to the situations presented to the TVAS.

3. The self-report measures were an accurate and honest self-assessment of behavior in the given situations.

4. The TAS and TVAS statements were an accurate reflection of specific styles of attentional behavior.

Definition of Terms

1. Attention: the cognitive process of selectively narrowing or broadly focusing on internal thoughts and feelings or external environmental stimuli.

2. Attentional style: a composite of effective and ineffective attentional behaviors of an individual along the attentional dimensions of width and direction.

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

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

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

6. Direction of attention: this refers to whether the attentional focus is internal or external.

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

8. Overloaded external focus of attention (OET): an ineffective type of attention in which the individual's attention is focused on too broad a range of environmental cues.

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

10. Overloaded internal focus of attention (OIT): an ineffective type of attention in which the individual's focus of attention is on too broad a range of cognitive and proprioceptive cues.

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

12. Underinclusive focus of attention (RED): an ineffective type of attention in which the individual's focus is reduced and directed towards too few internal or external cues.

13. Volleyball athlete: a female member of a college varsity volleyball team or a United States Volleyball Association (USVBA) "A" caliber or better player with college volleyball experience.

14. Successful volleyball athlete: an individual who reports that while playing volleyball she has been "on winning teams," "recognized," "successful," "rewarded," "happy," and "confident" to some degree.

15. Less successful volleyball athlete: an individual who reports that while playing competitive volleyball she was "on losing teams," "unnoticed," "unsuccessful," "frustrated," "sad," and "uncertain" to some degree.

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

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

18. Low anxious volleyball athlete: an individual whose score on competitive trait anxiety (SCAT) is distributed in the lower 50% of the distribution.

19. High anxious volleyball athlete: an individual whose score on competitive trait anxiety (SCAT) is distributed in the upper 50% of the distribution.

20. Anxiety: a cognitive/physical state characterized by heightened physiological arousal and a cognitive/emotional worry component.

21. Competitive trait anxiety: a predisposition to perceive competitive situations as threatening and to respond to these situations with feelings of worry or tension.

Delimitations of Study

1. This study involved only female athletes meeting the minimum standard of college varsity volleyball experience or better.

2. The TAS and TVAS measured attention with respect to width (broad/narrow) and direction (internal/external) on six subscales (BET, OET, BIT, OIT, NAR, RED) through general and volleyball specific situations, respectively.

3. The SCAT was a self-report assessment tool used as a measure of competitive trait anxiety.

4. The PAQ was a self-report measure of perceived ability and success.

5. Data were collected by a single investigator using a consistent approach.

Limitations of Study

1. The results of this study can only be generalized to volleyball athletes who are considered similar to those in this study.

2. Attention, anxiety, ability, and success were examined only within the confines of the definitions provided and tests used.

Chapter 2

REVIEW OF RELATED LITERATURE

Functions of Attention

Research on attention cuts across many disclipines--clinical psychology (Zubin, cited in Garmezy, 1977), neuropsychology and psychophysiology (Pribram & McGuinness, 1975), and sport psychology (Landers, 1980). Just as anxiety has been shown to be too multifaceted to be approached as a unitary variable (Endler & Okada, 1975), attention also seems to involve a number of concepts which make a singular practical definition difficult. Attention can be broadly defined as task- or goal-oriented perceptual processing: "The process of extracting information from ongoing events in a selective, active, economical way" (Gibson & Rader, 1979, p. 4). While global definitions of attention may vary somewhat, the central concept among definitions is selection across a range of possible stimuli.

Though different terminology is frequently used, there seems to be a consistent division of attention into two areas. Wachtel (1967) referred to content, or variables which make stimuli differentially perceptible to an individual, and structure, which emphasizes individual stylistic approaches (state and trait) to stimuli independent of content. Kahneman (1973) described involuntary attention as that which occurs from the inherent arousing aspects of stimuli, and voluntary attention as stimuli attended to because of their relevance to task demands. Posner and Snyder (1975) contrasted automatic activation and cognitive control phases of attention. Automatic activation processes occur without intention, conscious awareness, or interference from other mental activities, and are strictly the result of past learning. Cognitive control processes are conscious, under current control, and involve cognitive strategies,

presumably similar to the six attentional constructs presented by Nideffer (1976a). Taylor (1979) distinguished between physical attentional processes and psychological or cognitive attentional functions. His categorization of physical attentional processes seems to correspond with content, involuntary attention, and automatic activation descriptions, while psychological attention includes structure, voluntary attention, and cognitive control. Nideffer's (1976a) theory of attentional styles is based on psychological concepts. While understanding that automatic attentional processes are undoubtedly important, it is the cognitive control processes of attention which are potentially modifiable and, hence, of greater importance with regard to performance.

Attention, Arousal, and Anxiety

Just as definitions of attention are variable, clear distinctions between anxiety and arousal are rarely made in the literature. Since unclear definitions make it difficult to discuss arousal and anxiety as discrete variables, both will be discussed together with regard to their relationship with attention.

Spence and Spence (1966) touted the drive theory as an explanation of the relationship between arousal and performance. They theorized a linear increase in performance as a function of habit (dominant response) X drive (arousal). The dominant response of low-skilled persons is typically poor performance, while highly-skilled persons exhibit good performance as the dominant response. Thus, a low-skilled athlete would exhibit a decrease in performance under arousal conditions, while a highly-skilled athlete would show an increased performance level under heightened arousal conditions.

The inverted-U theory predicts a performance increase with increasing arousal up to an optimum point, beyond which further arousal increases

cause a performance decrement (Landers, 1980). For superior performers the crucial difference between these two positions, drive and inverted-U, is under conditions of high arousal, where drive theory predicts good performance (if that response is dominant) and the inverted-U theory predicts poor performance.

Oxendine (1970) utilized task complexity to add more precision to the inverted-U theory. He suggested the following reconceptualization of the Yerkes-Dodson law as it might apply to motor performance:

1. A high level of arousal is essential for optimal performance in gross motor activities involving strength, endurance, and speed.

2. A high level of arousal interferes with performances involving complex skills, fine muscle movements, coordination, steadiness, and general concentration.

3. A slightly-above-average level of arousal is preferable to a normal or subnormal arousal state for all motor tasks. (p. 25)

These guidelines and the inverted-U theory were both improvements over the drive theory since situation task demands were taken into account to some extent. In these theories the question of how arousal and performance interact was approached, but neither theory addressed the question of why arousal and performance covaried.

Easterbrook (1959) explained the relationships between arousal, performance, and task complexity using the notion of cue discrimination. Low arousal levels are characterized by poor performance because a wide range of cues are accepted uncritically. Moderate to optimal arousal increases narrow cue selection to the point that irrelevant cues are eliminated. Further increase in arousal causes perceptual narrowing and a consequent loss of task-relevant cues, yielding poorer performance

(Kahneman, 1973; Landers, 1980). Bacon (1974) attributed this narrowing to interference with memory through capacity overloading of the short-term memory stores.

Further explanation of Easterbrook's theory is offered by Kahneman (1973). High arousal decreases performance in tasks that require a broad focus of attention, since attention is focused on dominant cues at the expense of those peripheral to the task. Under high arousal conditions cue discrimination and selection become crucial to success. If the initial discrimination choices are inaccurate because of increased arousal, performance is less likely to be successful since the essential cues are not procured.

In summary, Kahneman stated several specific attentional changes, which occur at either high- or low levels of arousal. High arousal produces narrowing of attention, difficulty in fine discrimination, and systematic change in strategies. Thus, performance is likely to suffer as a result of perceptual processing failures. Low arousal levels produce failure to adopt a task set, failure in performance evaluation, and insufficient modification of capacity allocation to task demands. Performance is likely to decrease under conditions of low arousal in response to a lack of interest or effort.

Spielberger (1972) helped clarify the concept of anxiety by dichotomizing anxiety into trait and state components. Trait anxiety is a predisposition to perceive certain situations as threatening or stressful and to respond with varying amounts of state anxiety. State anxiety is the immediate feeling expressed in a stressful situation. This definition recognizes that situations are not inherently stressful. Stress and, hence, anxiety are determined by individual perception of the situation

as stress-inducing.

The relationship between attention and anxiety is fairly well established (Landers, 1980; Nideffer & Sharpe, 1978; Wachtel, 1967). Anxiety produces a narrowing of attentional focus, which can lead to performance decrements if the narrowed attentional style does not match the task demands. This performance decrement was demonstrated in a recent field study (Weinberg & Genuchi, 1980). Using Martens' Sport Competition Anxiety Test (1977) as a measure of competitive trait anxiety, the investigators found that low levels of anxiety facilitated golf performance, while high levels of anxiety disrupted golf performance. This finding supports Oxendine's contention that complex motor skills such as golf are best performed under conditions of low anxiety.

Witkin (1978) noted that high trait-anxious people scan the environment for non-essential cues, and this scanning interferes with the task relevant response. These people are categorized as mis-attentive rather than in-attentive. On the surface Witkin's finding seems somewhat inconsistent with the body of experimental literature, which predicts reduced scanning under high anxiety conditions. Wachtel (1967) suggests, however, that high trait-anxious people narrow their attention to such a degree that a stable orientation toward the environment cannot be maintained. This narrowing results in random, disorganized scanning in an effort to reestablish control over the perceptual process.

Sports, particularly team events, often present complex interactions that require a broad focus of attention (Nideffer, 1976b). Arousal (as well as anxiety) beyond an optimal point would be detrimental in situations that demanded the ability to selectively process a broad range of cues (Nideffer, 1976a). Thus, altering arousal and anxiety levels on an

individual basis to fit task attentional demands would seem crucial to successful performance. Logically, successful athletes would be those who are able to match their attentional style to the situation.

Attention and Sport Performance

Taylor's (1979) comprehensive review of the attentional literature emphasized a scarcity of quality and valid studies in actual sport situations. Many of the available studies purporting to measure psychological attention utilized the variable field-dependence-independence (Barrell & Trippe, 1975; Kane, 1972; Pargman, Schreiber, & Stein, 1974; Rotella & Bunker, 1978; Williams, 1975). Nideffer (1976a, 1976b) and Taylor (1979) predicted that the varying task demands of sport settings would require varying attentional styles. A valid field measure of attention should reflect the difference in attentional style relative to task demands. The results of field-dependence-independence research are inconclusive in differentiating team and individual sport participants, however, the sports in these two categories would seem to differ in attentional demands. Thus, the practical significance and validity of field-dependence as a measure of psychological attention in sport settings may be questioned.

Introversion-extroversion (Eysenck, 1952; Morgan & Costill, 1972) and augmentation-reduction (Petrie, 1960) are concepts which have also been related to attentional behavior. Augmenters and introverts exhibit greater ability to concentrate and maintain an internal orientation, while reducers and extroverts have lower concentration powers and are externally focused (Rotter, 1966; Ryan, 1976). These two concepts are generalizations modeled after the trait theory, and the importance of situational variance is ignored (Blumenstein & Hudanov, 1980). Thus,

introversion-extroversion and augmentation-reduction, just as field-dependence-independence, are less than ideal measures of attention in varied sport settings.

Zubin (cited in Garmezy, 1977) identified a threefold classification of effective attention in his review of attentional attributes of schizophrenics, namely (a) selection of a portion of the environment for focusing attention, (b) maintenance of attentional focus, and (c) shifting focus when required. These attributes are very similar to concepts emphasized by Nideffer (1976a), especially the "flip-flop" mechanism of switching attentional styles to accomodate changing task demands (Kahneman, 1973; Nideffer, 1976b). The narrowing effect of anxiety on attention can interfere with the ability of an athlete to freely switch attention when needed. An athlete suffering from high anxiety and narrowed attention would be unable to function effectively in situations that demand a switch from narrow to broad focus of attention.

Taylor's (1979) study offers some hope for future measurement of attention as a variable important to sport performance. He compared Nideffer's TAS with his soccer-specific inventory (TSAS) for their ability to discriminate between college soccer players of high perceived success and ability and low perceived success and ability. Each of the six TSAS attentional scales were able to differentiate soccer athletes of high- and low perceived ability and success, while only two of the attentional scales on the TAS were able to do so. In addition, soccer athletes of high perceived success and ability exhibited a broad external attentional focus on both the TAS and TSAS, while those of low perceived success and ability did not.

Two other studies utilizing the TAS as a measure of attention have

shown variable results. Richards and Landers (1980), in a pilot study using elite and subelite shooters, found standard rifle performance positively associated with broad external focus, and English match rifle performance positively associated with narrowed attentional focus. A follow-up study found no positive correlations with either broad external or narrow attentional focus and performance (Landers, Furst, & Daniels, 1981). Better shooters were less likely to be overloaded externally or excessively narrow, however. While definitive conclusions regarding shooting event task demands and effective attentional styles cannot be drawn from these results, evidence does seem to indicate that proficient shooters avoid ineffective attentional styles which could be detrimental to performance.

Comparison of results between shooters and soccer players is difficult from a predictive standpoint. Soccer is an "open" or interactive skill, and though skeet and trap shooting are also categorized as open skills, they are certainly on the low end of the open skill continuum when compared with soccer skills. The task demands of soccer and volleyball are superficially similar, certainly closer than soccer and shooting. Both volleyball and soccer are open, rapid-paced games with a premium placed on processing a broad range of cues. As was found with the soccer players (Taylor, 1979), one might expect the broad external style of attention to be crucial with respect to volleyball performance.

Summary

There is modest evidence to suggest that a sport-specific attention inventory ought to discriminate more accurately among success and ability characteristics of athletes in that sport than a general attention inventory. There also seems to be specific attentional demands associated

with various sports. Thus, it seems wise to pursue the development of situation-specific sport attention assessment devices to provide the coach and athlete with the most accurate information to help achieve optimal performance.

Chapter 3

METHODS AND PROCEDURES

Selection of Subjects

Subjects involved in this study were female volleyball athletes (N = 45) engaged in competitive volleyball play. Varsity collegiate or USVBA "A" level of play or better were the criteria for inclusion in the study. Thirty collegiate and 15 USVBA athletes, with a mean age of 20.13 years, completed the study. The population was limited to athletes competing in New York State for reasons of economy. Informed consent forms explaining the general intent of the study and ensuring confidentiality were distributed to, signed by, and collected from all subjects.

Testing Instruments

The attentional portion of the TAIS (first 74 statements), hereafter referred to as the TAS, was administered along with a test constructed for this study, a test of volleyball attentional style (TVAS). Two self-report measures were also included--a personal assessment questionnaire (PAQ) designed to measure perceived ability and success; and the Sport Competition Anxiety Test (SCAT), a measure of competitive trait anxiety.

Nideffer's (1976a) TAS contains 74 statements, 52 of which relate to attentional behavior across a broad range of situations. Six attentional subscales are included, three of which represent effective behavior--broad external focus (BET), broad internal focus (BIT), and narrow focus (NAR)--and three of which represent ineffective attentional functioning--overloaded external focus (OET), overloaded internal focus (OIT), and underinclusive focus (RED). Subjects responded to each situation on a 5-point Likert scale ranging from "never" to "always." Construct validity was reported for attentional subscales of the TAS (Nideffer, 1977). Test-retest reliability

coefficients ranged from .93 to .60 (Nideffer, 1976a).

The TVAS is composed of 84 statements which represent a variety of attentional demands in the competitive setting of volleyball. The statements were intuitively written based on the investigator's knowledge of volleyball as a coach and athlete. A slightly larger pool of situations was narrowed to the final 84 by discarding situations which did not seem to represent a discrete subscale or appeared likely to be misinterpreted by the athlete. Statements included in the final version were volleyball-specific but assumed to be general enough so that each athlete could relate to the situation in some manner, regardless of experience or positional differences.

The TVAS format was identical to that of the TAS. The 84 statements were listed randomly using a table of random numbers to encourage a response to each situation based on its own merit with no grouping bias. Subjects responded to each statement on a 5-point Likert scale ranging from "never" to "always."

Used as a measure of perceived success and ability, the PAQ is a modification of a semantic differential inventory used by Taylor (1979). The test incorporated six bipolar adjectives to describe success and nine to describe ability. Subjects were instructed to place an "X" along the 5-point scale in the space that best represented their perceived ability or success.

Martens' (1977) SCAT is composed of 15 statements, 10 of which are designed to reflect trait anxiety behavior in competitive situations. Subjects answer each statement on a 3-point scale--"hardly ever," "sometimes," or "often." Both positive and negative statements are included to reduce response bias. The SCAT is presented to subjects as the Illinois Competition Questionnaire and is described in the instructions as a measure of "feelings in sport situations" to avoid potential negative reactions to a test of anxiety.

Content and concurrent validity were established for the SCAT through extensive testing. Test-retest correlation coefficients ranged from .70 to .80 (Martens, 1977).

Methods of Data Collection

A test packet was provided to each athlete containing the following items: a #2 pencil, markread computer cards, informed consent form, TAS, PAQ, TVAS, and SCAT. The investigator brought the informed consent form to the attention of the athletes and requested that they read and sign the form if they were willing to participate in the study. After signing the consent form the athletes were asked to examine the four test instruments sequentially as the instructions for each were verbalized by the investigator. Emphasis was placed on completing the tests in the prescribed order (as a control procedure to minimize fatigue), and procedural questions were answered. Subjects were informed that most people could complete the tests in 40-50 minutes, but that they could take as long as necessary, and the testing was begun. Responses to the TAS and TVAS were made on markread computer cards, whereas the answers to the PAQ and SCAT were made on the test sheet.

From one to nine athletes were tested at any given session, at a time and place mutually agreeable to them and investigator. The testing environment was varied, but care was taken to ensure that relative quiet was maintained during testing to reduce distracting breaks in concentration. Beyond a standardized presentation and test packet, no environmental controls were established.

Data were collected between May, 1980 and May, 1981. Approximately 4-6 weeks after the initial test administration, 13 athletes were retested to provide a measure of reliability.

Scoring of Data

Markread cards containing TAS and TVAS data were submitted to the computer,

which read the scores, assigning an appropriate value from 1-5 for each response. These data were then entered on a disk file for future use. The PAQ was scored by hand using a punched stencil with the appropriate value from 1-5 recorded for each response. Since the PAQ sheet contained both success and ability data, subtotals were obtained for each component. The SCAT was also scored by hand following the instructions provided by Martens (1977). All PAQ and SCAT data were then transferred to a master data sheet, and subsequently to data cards for computer analysis.

Treatment of Data

Test-retest coefficients (4-6 week interval) to determine the stability of both the TAS and TVAS were computed using the Pearson product-moment correlation. Internal consistency for each of the six attentional subscales on the TAS and TVAS was computed using Cronbach's coefficient alpha analysis (Cronbach, 1951).

As a preliminary to statistical computations, subjects were ranked according to their anxiety, ability, and success scores. A median-split was approximated using the nearest natural break in the scores to provide a high- and low group for each independent variable. The effects of levels of anxiety, ability, and success were calculated using multivariate analysis of variance. This was followed by univariate analysis of variance and discriminant function analysis to determine which dependent measures contributed to significant differences between anxiety, ability, and success. Canonical correlation was utilized to assess the multivariate relationship between the predictor variables (competitive trait anxiety, perceived ability, perceived success) and the outcome variables (attentional scales of the TAS and TVAS).

Summary

The TAS and TVAS were used to assess attentional behavior of female volleyball athletes (N = 45). Both were administered along with a personal

assessment questionnaire (PAQ), to measure perceived success and ability, and SCAT, a measure of competitive trait anxiety. All athletes were tested over a 1-year period, from May 1980 to May 1981. Thirteen subjects were retested after a 4-6 week interval to gain a measure of test-retest reliability for each of the instruments.

Internal consistency for the six attentional subscales of the TAS and TVAS was calculated. Athletes were ranked and divided into high- and low anxiety, ability, and success groups using a median-split technique. Six separate MANOVA's were performed to determine the effects of levels of anxiety, ability, and success on attention as represented by the TAS and TVAS. ANOVA's and discriminant function analysis followed the MANOVA's to determine the amount of difference contributed by the various attentional subscales. Canonical correlation was utilized to assess the relationship between the predictor variables (anxiety, ability, success) and the outcome variables (attentional style).

Chapter 4

ANALYSIS OF DATA

The results of the investigation are presented in this chapter, and are reported for the following major topics: internal consistency for the attentional scales of the TVAS and TAS; test-retest reliability for the TAS, TVAS, PAQ, and SCAT; MANOVA's, ANOVA's, and discriminant function analysis for the TVAS and TAS; and canonical correlation.

Internal Consistency for the Attentional Scales of the TVAS and TAS

The internal consistency of subunits of a test are measured by coefficient alpha (Cronbach, 1951). Alpha reliabilities for each of the six attentional scales of the TVAS and TAS are reported in Table 1. Two coefficients are listed for some scales. Coefficients appearing in parentheses are values adjusted to improve internal consistency by deleting items correlating negatively or below .10 with the scale as a whole. Adjusted reliability coefficients for the TAS varied from a high of .75 (OET) to a low of .52 (NAR), a range of .23. Adjusted reliability coefficients for the TVAS varied from .85 (BET) to .59 (NAR), a range of .26. The TAS values are similar to those obtained by Taylor (1979).

Test-retest Reliability for the Attentional Scales of the TVAS and TAS

Test-retest coefficients for the 13 athletes who retook both tests after a 4-6 week period are reported in Table 2. Test-retest reliability coefficients, measures of response stability over time, varied from .98 (BIT) to .66 (NAR) for the TAS scales, a range of .32. The TVAS scales varied from .99 (BET, OIT) to .89 (NAR), a range of .10. The TAS values are higher than those obtained by Taylor (1979).

Table 1

Internal Consistency of Test of Attentional Style (TAS) and Test of Volleyball Attentional Style (TVAS)

Variables	TAS	TVAS
BET	.61	.85
OET	.75	.68 (.76)[e]
BIT	.40 (.69)[a]	.80 (.82)[f]
OIT	.43 (.60)[b]	.80 (.82)[g]
NAR	-.03 (.52)[c]	.33 (.59)[h]
RED	.23 (.60)[d]	.71 (.74)[i]

[a] Items 29, 24, and 27 deleted.

[b] Items 59 and 73 deleted.

[c] Items 4, 14, 18, 26, 28, 29, and 32 deleted.

[d] Items 6, 15, 17, 48, 49, 51, and 69 deleted.

[e] Items 39 and 43 deleted.

[f] Item 13 deleted.

[g] Item 80 deleted.

[h] Items 3, 5, 27, and 51 deleted.

[i] Items 2 and 18 deleted.

Table 2

Test-retest Reliability for Attentional Variables and Competitive Trait Anxiety, Perceived Success, and Perceived Ability

Attentional Variables	TAS r	TVAS r	Predictor Variables	r
BET	.95	.99	Anxiety	.97
OET	.97	.96	Success	.98
BIT	.98	.95	Ability	.96
OIT	.97	.99		
NAR	.66	.89		
RED	.93	.98		

Test-retest Reliability for Competitive Trait Anxiety (SCAT), Perceived Ability, and Perceived Success (PAQ)

Test-retest coefficients for the 13 athletes who retook the SCAT and PAQ are reported in Table 2. The reliability coefficients were .97 for anxiety, .96 for ability, and .98 for success. These reliabilities are higher than those reported elsewhere for SCAT (Martens, 1977), and for the PAQ (Taylor, 1979).

MANOVA, ANOVA's, and Discriminant Function Analysis for Anxiety Levels with the Attentional Scales of the TVAS

MANOVA for anxiety levels (high and low) with the TVAS attentional variables revealed a significant overall group difference, F (6, 38) = 4.04, $p < .05$. The finding of a significant difference supported the first hypothesis that volleyball athletes who report themselves to be low anxious will exhibit a significantly different attentional style on the TVAS.

ANOVA's for anxiety levels on the TVAS (Table 3) revealed significant group differences ($p < .05$) for the OET, OIT, and NAR scales. Significantly higher means were reported for OET and OIT for the high anxious group, and a significantly higher mean was reported for NAR for the low anxious group. High competitive trait anxiety athletes were overloaded externally and internally and were less able to narrow attention effectively. Though significant differences were not shown for the other three TVAS scales, all three maintained the hypothesized directionality.

Discriminant function analysis revealed the relative contribution that each TVAS variable made to the overall significant between group difference. The OET scale contributed 39.62% to the variance, followed by 29.56% from the OIT scale, and 16.93% from the RED scale. These three scales contributed 86.11% to the between anxiety groups variance.

Table 3

Means, Standard Deviations, and ANOVA's of TVAS Variables for High- and Low-Competitive Trait Anxiety Athletes

Attentional Variables	High Anxiety[a]		Low Anxiety[b]		
	M	SD	M	SD	F
BET	52.52	8.87	56.86	5.58	3.83
OET	21.52	4.63	17.55	3.07	11.42**
BIT	53.17	7.32	55.91	4.99	2.12
OIT	42.35	8.80	34.73	3.83	13.95**
NAR	23.17	4.14	25.32	2.89	4.03*
RED	29.26	6.34	26.82	3.86	2.41

[a] $N = 23$.

[b] $N = 22$.

*$p < .05$.

**$p < .01$.

MANOVA, ANOVA's, and Discriminant Function Analysis for Perceived Ability Levels with the Attentional Scales of the TVAS

MANOVA for perceived ability levels (high and low) with the TVAS attentional variables revealed a significant overall group difference, F (6, 38) = 2.99, $p < .05$. The finding of a significant difference supported the second hypothesis that volleyball athletes who report themselves to be of high ability will exhibit a significantly different attentional style on the TVAS.

ANOVA's for perceived ability levels on the TVAS (Table 4) revealed a significant group difference ($p < .05$) for the OIT scale. A significantly higher mean on OIT was reported for the low ability group. Low ability athletes were more likely to be overloaded internally. Though statistically significant differences were not shown for the other five variables, all five scales maintained the hypothesized directionality.

Discriminant function analysis on the TVAS variables revealed the major variables contributing to the significant between group difference. The OIT scale contributed 51.42% to the variance, followed by 18.46% from the RED scale, and 14.75% from the BIT scale. These three scales contributed 84.63% to the between anxiety groups variance.

MANOVA, ANOVA's, and Discriminant Function Analysis for Success Levels with the Attentional Scales of the TVAS

MANOVA for perceived success levels (high and low) and the TVAS variables revealed a significant overall group difference, F (6, 38) = 4.92, $p < .001$. The finding of a significant difference supported the third hypothesis that volleyball athletes who report themselves to be highly successful will exhibit a significantly different attentional style on the TAS.

ANOVA's for perceived success levels on the TVAS (Table 5) revealed

Table 4

Means, Standard Deviations, and ANOVA's of TVAS Variables for High- and Low-Perceived Ability Athletes

Attentional Variables	High Ability[a]		Low Ability[b]		
	M	SD	M	SD	F
BET	56.24	9.25	53.25	5.13	1.73
OET	18.67	4.92	20.37	3.60	1.73
BIT	55.05	7.55	54.04	4.82	.27
OIT	35.57	9.24	41.29	4.09	6.85*
NAR	24.90	3.28	23.62	4.11	1.35
RED	27.57	6.71	28.50	3.33	.33

[a] $N = 21$.

[b] $N = 24$.

*$p < .05$.

Table 5

Means, Standard Deviations, and ANOVA's of TVAS Variables for High- and Low-Perceived Success Athletes

Attentional Variables	High Success[a]		Low Success[b]		
	M	SD	M	SD	F
BET	57.90	6.69	51.79	7.46	8.28*
OET	17.10	3.85	21.75	3.66	17.27**
BIT	57.62	5.93	51.79	5.53	11.62**
OIT	33.48	4.26	43.12	7.40	27.61**
NAR	25.48	4.05	23.12	3.06	4.91*
RED	25.86	3.93	30.00	5.76	7.71**

[a] $N = 21$.

[b] $N = 24$.

*$p < .05$.

**$p < .01$.

significant group differences ($p < .05$) for all six attentional scales. Significantly higher means were reported for BET, BIT, and NAR scales for the high success groups. Significantly higher means were reported for OET, OIT, and RED scales for the low success group. Successful athletes were likely to maintain an effective attentional focus whether internal, external, broad, or narrow. Less successful athletes were unable to maintain an effective attentional focus.

Discriminant function analysis on the TVAS variables revealed the major variables contributing to significant between group difference. The OIT scale contributed 48.24% to the variance, followed by 28.37% from the OET scale. These two scales contributed 76.61% to the total variance.

MANOVA, ANOVA's, and Discriminant Function Analysis for Anxiety Levels with the Attentional Scales of the TAS

MANOVA for anxiety levels (high and low) with the TAS variables revealed a significant overall group difference, F (6, 38) = 4.23, $p < .005$. The finding of a significant difference led to the rejection of the fourth hypothesis that there will be no significant difference between volleyball athletes who considered themselves to be high- or low anxious.

ANOVA's for anxiety levels on the TAS (Table 6) revealed significant group differences ($p < .05$) for the OET and NAR scales. Significantly higher means were reported for the OET and NAR scales for the high anxious group. High competitive trait anxious athletes were likely to be overloaded externally, but also seemed to be able to narrow attention effectively. The BET, BIT, and RED scales maintained the hypothesized directionality, while the OIT scale did not.

Discriminant function analysis on the TAS variables revealed the major contributors to significant between group difference. The NAR scale

Table 6

Means, Standard Deviations, and ANOVA's of TAS Variables for High- and Low-Competitive Trait Anxiety Athletes

Attentional Variables	High Anxiety[a]		Low Anxiety[b]		
	M	SD	M	SD	F
BET	20.91	4.08	22.05	2.21	1.32
OET	34.26	5.56	30.73	5.90	4.28*
BIT	15.78	3.75	17.50	2.22	3.45
OIT	18.78	2.37	19.50	4.08	.53
NAR	19.09	2.47	17.00	2.71	7.32*
RED	22.87	3.53	21.27	4.07	1.98

[a] $N = 23$.

[b] $N = 22$.

*$p < .05$.

contributed 79.85% to the variance, followed by 11.50% from the BET scale. These two scales accounted for 91.35% of the between groups variance.

MANOVA, ANOVA's, and Discriminant Function Analysis for Ability Levels with the Attentional Scales of the TAS

MANOVA for perceived ability levels (high and low) with the TAS attentional variables revealed a significant overall group difference, F (6, 38) = 9.37, $p < .001$. The finding of a significant difference led to the rejection of the fifth hypothesis that there will be no significant difference between volleyball athletes who considered themselves to be of high- or low ability.

ANOVA's for perceived ability levels on the TAS (Table 7) revealed significant group differences ($p < .05$) for the BET, OIT, and RED scales. A significantly higher mean was reported for BET for the high ability group, and significantly higher means were reported for OIT and RED for the low ability group. High ability athletes maintained a broad external focus, while low ability athletes were likely to be ineffective attentionally through internal overloading and excessive narrowing of attention. Though statistically significant differences were not shown for the other three TAS variables, all three maintained the hypothesized directionality.

Discriminant function analysis on the TAS variables revealed the major contributors to significant between group difference. The RED scale contributed 56.15% to the variance, followed by 27.06% from the OIT scale. These two scales accounted for 83.21% of the between groups variance.

MANOVA, ANOVA's, and Discriminant Function Analysis for Success Levels with the Attentional Scales of the TAS

MANOVA for perceived success levels (high and low) with the TAS variables revealed a significant overall group difference, F (6, 38) = 5.87,

Table 7

Means, Standard Deviations, and ANOVA's of TAS Variables for High- and Low-Perceived Ability Athletes

Attentional Variables	High Ability[a]		Low Ability[b]		
	M	SD	M	SD	F
BET	23.05	2.40	20.08	3.43	11.00**
OET	30.76	5.43	34.08	6.04	3.72
BIT	17.57	2.16	15.79	3.72	3.71
OIT	17.95	2.64	20.17	3.52	5.57*
NAR	18.33	2.97	17.83	2.62	.36
RED	19.48	3.49	24.37	2.46	30.19**

[a] $N = 21$.

[b] $N = 24$.

*$p < .05$.

**$p < .01$.

$p < .001$. The finding of a significant difference led to the rejection of the sixth hypothesis that there will be no significant difference between volleyball athletes who considered themselves to be successful or less successful.

ANOVA's for perceived success levels on the TAS (Table 8) revealed significant group differences ($p < .05$) for the BET, BIT, OET, and RED scales. Significantly higher means were reported for BET and BIT for the high success group, and significantly higher means were reported for OET and RED for the low success group. Successful athletes maintained broad internal and external focus of attention, while less successful athletes were overloaded externally and narrowed attention excessively. The NAR scale maintained the hypothesized directionality, while no between groups difference was found for the OIT scale.

Discriminant function analysis on the TAS variables revealed the major contributors to the significant between group difference. The RED scale contributed 41.85% to the variance, followed by 35.05% from the BET scale. These two scales accounted for 79.90% of the between groups variance.

Canonical Correlation

Canonical correlation assessed the multivariate relationship between the outcome measures (attentional scales) and the predictor variables (competitive trait anxiety, perceived ability, perceived success). Two significant correlations were found, using the TVAS variables. The first correlation, $R_c = .84$, $\chi^2 (18) = 68.00$, $p < .001$, revealed the following pattern:

High perceived success ⟷ Low OIT and high RED.

Successful athletes did not become overloaded internally, but tended to narrow attention excessively at times.

Table 8

Means, Standard Deviations, and ANOVA's of TAS Variables for High- and Low-Perceived Success Athletes

Attentional Variables	High Success[a]		Low Success[b]		
	M	SD	M	SD	F
BET	23.33	2.82	19.83	2.85	17.05**
OET	30.57	5.67	34.25	5.74	4.66*
BIT	17.95	2.56	15.46	3.27	7.95**
OIT	19.14	3.37	19.12	3.31	.00
NAR	18.24	3.32	17.92	2.24	.15
RED	19.81	3.27	24.08	3.19	19.68**

[a] $N = 21$.

[b] $N = 24$.

*$p < .05$.

**$p < .01$.

The second correlation, $R_c = .54$, χ^2 (10) = 19.39, $p < .05$, revealed the following pattern:

High competitive trait anxiety, low perceived success, and high perceived ability ⟷ High BET, low OET, low BIT, high OIT, high NAR, and high RED.

This profile depicted athletes who either mis-perceived themselves to be of high ability, or who were high in ability but unsuccessful because of anxiety-induced internal overloading and excessive narrowing of attention. This profile would not seem to promote successful volleyball performance.

Using the TAS variables, one significant canonical correlation was found, $R_c = .76$, χ^2 (18) = 50.34, $p < .001$, revealing the following pattern:

Low perceived success and ability ⟷ Low BET and high RED.

This profile fit the athletes who perceived themselves to be low in ability and success. Such athletes had difficulty maintaining a broad external focus and were prone to excessive narrowing. This profile would not seem conducive to successful volleyball performance.

Summary

Adjusted alpha reliabilities for internal consistency on the TVAS varied from .85 to .59. The TAS reliabilities varied from .75 to .52, values similar to those obtained by Taylor (1979). Test-retest values were high for all variables except for the NAR scale on the TAS, which was moderately reliable.

As hypothesized, MANOVA's revealed that volleyball athletes who reported themselves to be low anxious, of high ability, and successful were significantly different in attentional style as measured on the TVAS than those who were high anxious, of low ability, and less successful. Contrary to the hypotheses, MANOVA's revealed that volleyball athletes who reported

themselves to be low anxious, of high ability, and successful were significantly different in attentional style as measured on the TAS than those who were high anxious, of low ability, and less successful.

ANOVA's assessed which attentional scales differentiated competitive trait anxiety, perceived ability, and perceived success groups. OET, OIT, and NAR attentional scales differentiated between anxiety, ability, and success groups most frequently on the TVAS; BET, OET, and RED differentiated most frequently between groups on the TAS.

Discriminant function analysis revealed that OIT, BET, and RED were the greatest contributors to variance on the TVAS, while RED and BET largely contributed to the between group variance on the TAS.

Canonical correlation analyses revealed two significant relationship patterns between the predictor variables and outcome measures of the TVAS, and one significant relationship for the TAS.

Chapter 5

DISCUSSION OF RESULTS

The results presented in chapter 4 will be discussed in this chapter. The following topics are included: internal consistency of the TVAS and TAS; test-retest reliability of the TVAS, TAS, PAQ, and SCAT; anxiety levels and the attentional scores on the TVAS and TAS; ability levels and the attentional scores on the TVAS and TAS; success levels and the attentional scores on the TVAS and TAS; recurring attentional patterns; and the attentional style of volleyball athletes.

Internal Consistency of the TVAS and TAS

Coefficient alpha reliabilities for the attentional scales of the TVAS and TAS are reported in Table 1. Cronbach's (1951) alpha reliability is a measure of internal consistency. Attentional scales reflecting a high alpha coefficient contain items that were answered in a homogeneous manner. Corrected reliabilities in parentheses represented reliabilities adjusted by deleting items correlating negatively or below .10 with the scale total. Corrected alpha reliabilities ranged from .85 (BET) to .59 (NAR) for the TVAS, and .75 (OET) to .52 (NAR) for the TAS.

The corrected alpha coefficients were greater for each attentional scale on the TVAS than the corresponding TAS scale. Because the TAS situations were conceptually broader than those on the TVAS, they may have been open to greater interpretation by individuals. Response inconsistency on the TAS would tend to support the claim that attention is not generalizable enough to remain consistent across a broad range of life situations as well as specific situations (Taylor, 1979).

Deletion of items from the TVAS to increase internal consistency can be supported. Any newly constructed assessment device must undergo a

period of testing during which validity and reliability are firmly established. Since this study represented the first use of the TVAS, one would expect adjustments to be necessary as the test is refined. Removal of items which correlate poorly with the assigned attentional attribute represents a legitimate method of increasing reliability and validity of the TVAS.

Ten of 84 items were deleted from the TVAS, and 19 of 52 items from the TAS. That over one-third of the TAS items were deleted to increase internal consistency to a reasonable level may indicate some serious deficiencies in the TAS as a measure of attention suitable for use in a sport-specific situation. Nideffer's (1977) reliability and validity testing of the TAS seems rather minimal, and might account for the poor internal consistency of the TAS in this study. The apparent instability of several of the TAS scales should be taken into account by future investigators planning to use the TAS with populations and in situations other than those tested by Nideffer.

The NAR scale deserves additional comment. Approximately one-third of the items deleted from the TVAS and TAS belonged to the NAR scale. Even after major "surgery" of this sort, the alpha reliability reached only a moderate level for the TVAS and TAS. Nideffer (1976a) conceptualized narrow attention as including both internal and external focus of attention. Taylor (1979) noted that persons might narrow attention effectively but be unable to maintain an internal focus on individual thoughts when appropriate. The results from both this study and Taylor's research point to a need for separate narrow internal and external scales.

Reliability of the TVAS, TAS, PAQ, and SCAT

The test-retest reliability coefficients for each of the six TVAS and

TAS attentional scales are reported in Table 2. Thirteen athletes retook the tests 4-6 weeks after the initial administration as a measure of response stability. Reliability coefficients ranged from .99 (BET) to .89 (NAR) for the TVAS, and .98 (BIT) to .66 (NAR) for the TAS. The range of coefficients was .32 for the TAS and .10 for the TVAS. The low reliability of the NAR scale extended the range of coefficients for each test considerably--.06 for the TVAS and .27 for the TAS. With the exception of the NAR and RED scales, all reliability coefficients were above .93. Nideffer (1977) reported test-retest reliability for the TAS scales ranging from .93 to .60.

Exclusive of the NAR scale, the average test-retest reliability was very similar for both the TVAS and TAS, and also unexpectedly high (.90). Test-retest coefficients are based on an individual's total score on the test rather than on an item-by-item basis. Thus, it would be possible for individual changes in answers to cancel each other out in the total score and reflect an inflated reliability. Even so, one would not expect the values to be as high as those reported here. Because of the small test-retest sample size (N = 13), the results are possibly spurious.

The test-retest reliability coefficients for the PAQ and SCAT are listed in Table 2. The PAQ coefficients for ability (r = .96) and success (r = .98) are both considerably higher than those reported by Taylor (1979). The coefficient for competitive trait anxiety (r = .97) is also higher than that reported by Martens (1977). Once again, these reliability coefficients seem high, and can most reasonably be attributed to the small sample size.

Competitive Trait Anxiety and the Attentional Scores of the TVAS and TAS

MANOVA with the TVAS variables revealed a significant difference between athletes of high- and low competitive trait anxiety, F (6, 38) = 4.23, $p < .005$. The finding of a significant difference on both the TVAS and TAS led to the acceptance of the first hypothesis and rejection of the second hypothesis. There was a significant difference between scores on both the TVAS and TAS for volleyball athletes who regarded themselves to be low anxious and those who were high anxious. Anxiety has a powerful negative effect on volleyball performance. Volleyball movements are automatic motor programs keyed by visual cues, which occur with great rapidity in the environment. A broad external focus is usually necessary for effective performance; narrowing or internalizing of attention due to anxiety during play leads to performance decrements and a rash of team errors which seem to characterize the game of volleyball. Nideffer (1976a) claimed that the TAS has some predictive validity for attentional behavior in specific environments, and the current results tend to support his claim. Both tests provided empirical evidence in support of attentional style as as important factor in volleyball performance.

ANOVA's for anxiety levels with each of the six attentional variables of the TVAS and TAS revealed differences between the two tests. Significant anxiety group differences ($p < .05$) were revealed for OET, OIT, and NAR scales of the TVAS (Table 3), and the OET and NAR scales of the TAS (Table 6). TVAS measures suggested that high anxious athletes are overloaded internally and externally, and that low anxious athletes are able to narrow attention effectively. Results from the TAS suggested that high anxious athletes are overloaded externally, but still able to narrow attention effectively. TVAS and TAS results are oppositional with respect to the NAR scale. The assertion that attention narrows under anxiety conditions is well supported

(Landers, 1980). The fact that the TAS reported an effective narrow focus under high anxiety conditions reflects that either the literature to date is in error, or that the TAS is a poor measure of attention with respect to competitive trait anxiety. Though no reasonable explanation can be offered for these results, apparently the NAR scale on the TAS is unable to appropriately capture the relationship between anxiety and attention.

Discriminant function analysis on the TVAS variables revealed that OET contributed 39.62%, OIT 29.56%, and RED 16.93% to the between group variance, a total of 86.11%. These results suggest that an ineffective attentional style may be of greater consequence than having an effective attentional style. While an effective attentional focus may be a precursor to athletic success, an ineffective attentional focus will practically ensure failure.

Discriminant function analysis on the TAS variables revealed that NAR contributed 79.85% and BET 11.50% to the between group variance, a total of 91.35%. Though the TAS captured a large portion of the anxiety groups variance, it did so inappropriately and is thus a poor measure of the relationship between competitive trait anxiety and attention.

Ability Levels and Attentional Scores of the TVAS and TAS

MANOVA with the TVAS attentional variables revealed a significant difference between athletes of high- and low ability, F (6, 38) = 2.99, $p < .05$. A significant overall group difference was also revealed for the TAS, F (6, 38) = 9.37, $p < .001$. The finding of a significant difference on both the TVAS and TAS led to the acceptance of the third hypothesis and a rejection of the fourth hypothesis. There was a significant difference between the scores on both the TVAS and TAS for

volleyball athletes who perceived themselves as being of low ability versus those who perceived themselves to be of high ability. Although both the TVAS and TAS provided support of attentional abilities as determiners of volleyball performance, the area of psychological skills has generally been neglected by coaches in favor of physical skill development. These results suggest that coaches and athletes would be wise to express an interest in attentional abilities in the future.

ANOVA's for ability levels with each of the six attentional variables of the TVAS and TAS revealed differences between the two tests. Significant ability group differences ($p < .05$) were revealed for the OIT scale of the TVAS (Table 4), and the BET, OIT, and RED scales of the TAS (Table 7). TVAS measures suggested that low ability athletes are frequently overloaded internally. Results from the TAS suggested that high ability athletes maintain a broad external focus, while low ability athletes become overloaded internally and narrow attention excessively. Both tests are in agreement on internal overloading among low ability athletes. Volleyball players of high ability would be expected to maintain a broad external focus of attention because of the task demands of the sport. Because there are rarely times in performing when a player should narrow down to a single thought or object, athletes who narrow attention excessively would be expected to be of lesser ability. With respect to the BET and RED scales, the TAS is a better discriminator among ability groups than the TVAS.

Discriminant function analysis on the TVAS variables revealed that OIT contributed 51.42%, RED 18.46%, and BIT 14.75% to the between group variance, a total of 84.63%. Once again attentional overloading seemed to be a key discriminator of volleyball performance. Internal overloading

accounted for over 50% of the variance, an importance which is not inflated when the task demands of volleyball are considered. Effective performance during the course of a rally is predicated on remaining external (both broad and narrow) in order to select and act upon the proper environmental cues. Athletes who are overloaded internally would not possess the attentional abilities to successfully meet the task demands of volleyball, since valuable cues essential to performance would be ignored.

Discriminant function analysis on the TAS variables revealed that RED contributed 56.15% and OIT 27.06% to the between group variance, a total of 83.21%. The reasoning used above for internally overloaded athletes applies to those who narrow excessively. High ability and reduced attention are mutually exclusive in volleyball, since a single cue or action rarely yields enough information to allow one to effectively participate in the game.

Success Levels and Attentional Scores of the TVAS and TAS

MANOVA with the TVAS attentional variables revealed a significant difference between athletes of high- and low success, F (6, 38) = 4.92, $p < .001$. A significant overall group difference was also revealed for the TAS, F (6, 38) = 5.87, $p < .001$. The finding of a significant difference on the TVAS and TAS led to the acceptance of the fifth hypothesis and a rejection of the sixth hypothesis. There was a significant difference between the scores on the TVAS and TAS for volleyball athletes who regarded themselves as successful and those who perceived themselves as less successful. Among volleyball players of equal skill, attentional abilities often distinguish the more successful

athletes. Individual attentional errors tend to magnify themselves and affect team play in volleyball. Errors become contagious as teammates are unable to maintain their own attentional focus; team members become stressed or distracted by the mistakes and reaction to those mistakes of others. Thus, attentional behavior is an important factor in volleyball success.

ANOVA's for success levels with each of the six attentional variables of the TVAS and TAS revealed differences between the two tests. Significant success group differences ($p < .05$) were revealed for all six scales of the TVAS (Table 5), and the BET, BIT, OET, and RED scales of the TAS (Table 8). TVAS measures suggested that successful athletes exhibit a broad external and internal focus, and narrow effectively when the situation demands. Less successful athletes are overloaded internally and externally, and narrow attention excessively. Results from the TAS suggested that successful athletes are able to maintain a broad external and internal focus. Less successful athletes are overloaded externally and narrow attention excessively.

With respect to success, the TVAS differentiated successful from less successful athletes on all six attentional scales while the TAS did so only on four. The superiority of the TVAS over the TAS with success groups seems clear, due to the fact that OIT did not emerge as a significant success differentiator on the TAS. As stated earlier, OIT may well be the crucial attentional behavior in volleyball performance. Internally overloaded volleyball players are "trapped" in their own minds and unable to effectively process external cues. The likelihood of such players being successful is almost non-existent.

Discriminant function analysis on the TVAS variables revealed that

OIT contributed 48.24% and OET 28.37% to the between groups variance, a total of 76.61%. The results reaffirm the importance of avoiding overloaded attentional processes if one wishes to be an effective and successful volleyball player.

Discriminant function analysis on the TAS variables revealed that RED contributed 41.85% and BET 35.05% to the between group variance, a total of 76.90%. Although the TVAS predictors were better measures of volleyball success, the TAS results reflected the importance of maintaining a broad external focus and avoiding excessive narrowing.

Recurring Attentional Patterns

Canonical correlation was utilized to assess the multivariate relationship among the predictor variables (anxiety, ability, and success) and the outcome variables (attentional style). Two significant relationships were found with the TVAS.[1] The first correlation, $R_c = .84$, χ^2 (18) = 68.00, $p < .001$, revealed the following pattern:

High success ⟷ Low OIT and high RED.

This relationship accounted for approximately 83% of the total available variance, a magnitude that may represent a sizeable recurrence among the sample. This relationship indicated that successful athletes in this sample did not become overloaded internally (the crucial point), but did tend to narrow excessively at times. One possible explanation for the high RED value among athletes who perceived themselves as successful is that they rest on their laurels of past successes, taking effective performance for granted. Volleyball players of this type often fail to process as broadly as they might normally when maximum effort is required, and hence miss cues that would increase performance consistency (Kahneman, 1973).

The second correlation, $\underline{R}_c = .54$, χ^2 (10) = 19.39, $\underline{p} < .05$, revealed the following pattern:

High competitive trait anxiety, low perceived success, and high perceived ability ⟷ High BET, low OET, low BIT, high NAR, and high RED.

This profile could be interpreted in two different ways. The first would be athletes who falsely perceived themselves to be of high ability, when in fact most of the attentional scales revealed that they possessed few effective psychological abilities. This combination resulted in the low perception of success in the profile. The second possibility would be athletes who possessed high ability (probably perceived as high physical ability), but who experienced little success because of attentional narrowing and overloading caused by anxiety. In the first case, the athletes suffer from a "reality gap" in what they perceive their abilities to be and what they actually are. In the second instance, athletes find the volleyball environment so stressful that their talent is negated by anxiety.

A significant canonical correlation was found with the TAS, $\underline{R}_c = .76$, χ^2 (18) = 50.34, $\underline{p} < .001$. The following pattern was revealed:

High perceived success and ability ⟷ High BET and low RED.

This relationship accounted for approximately 72% of the total available variance and indicated that a number of athletes in this sample, who perceived themselves to be of high ability and successful, exhibited a broad external focus and did not reduce attention excessively. While this pattern represents effective attentional functioning, it also highlights the inability of the TAS to differentiate on the overload scales that are so apparently crucial to volleyball performance.

The Attentional Style of Volleyball Athletes

Volleyball is a sport which requires of the athlete the ability to select the proper cues from a wide range of those available. An effective player is one who can maintain a broad external focus as play is initiated, rapidly eliminate options, and finally focus narrowly on a few cues which will ultimately determine the direction of the ball and the reactions of the athlete. An effective pattern of attention during an extended rally is typically broad external-narrow external-broad external. Broad internal attention is also of some importance--during breaks in play, timeouts, and before serving--though perhaps less so than the external competencies.

What is even more crucial to volleyball performance, however, is the ability to avoid the ineffective attentional styles. Few athletes are trained to cope with the stresses of athletic competition. A typical response to such incidents as personal or team errors, coaching criticism, an unfamiliar or uncomfortable environment, and intimidating competition is internal overloading through covert self-talk. This type of attentional behavior prevents the athlete from processing the external cues necessary for effective performance. Overloaded internal attentional behavior is frequently accompanied by increased anxiety (Nideffer, 1977), which can cause the athlete to narrow attention excessively. An athlete with an overloaded external attentional focus attempts to process too many cues; this results in confusion and, out of desperation, inappropriate cue selection. Thus, with reference to the sport of volleyball at least, identifying ineffective attentional styles seems more important than identifying effective attentional behaviors.

Ineffective attentional scales contributed more to the between groups variance than effective scales when the discriminant function values for

the TVAS and TAS were combined. Comparing the combined variance of anxiety, ability, and success groups showed a distinct difference between the TVAS and TAS, however. Most of the TAS variance accounted for could be attributed to the effective scales (BET, NAR), while most of the TVAS variance arose from the ineffective attentional scales (OET, OIT). Given the attentional requirements for volleyball, the TVAS would seem the more useful measure of attentional style.

Two other bits of information were gleaned from the discriminant function analysis. Even though the NAR scale contributed over 79% of the TAS anxiety group variance and elevated the TAS above the TVAS as a measure of narrowed attention, it should be noted that the NAR scale was not significant in the direction predicted by the literature (Kahneman, 1973; Landers, 1980; Taylor, 1979). This further lessens the practical usefulness of the TAS with respect to the volleyball setting. In addition, the BIT scale was shown on both the TVAS and TAS to be of little predictive value relative to volleyball performance. This was as predicted in the earlier discussion of volleyball task demands. The speed and structure of the game generally make a broad internal focus of attention a behavior of lesser importance in the sport.

The results show a consistent relationship between competitive trait anxiety and the ineffective scales of the TVAS, especially OET and OIT. These results suggest that not only does anxiety narrow attention, but it may also contribute to overloaded types of attention as well. Worry is a component of anxiety which could contribute to internal overloading. Internal preoccupation due to anxiety might also precipitate an external overload as the athlete seeks to put the internalized self-coaching strategies (e.g., "Be ready!," "Watch the . . . ," "Remember the . . .") into practice, all in rapid sequence. If further substantiated, this

finding could be of great importance to coaches. Training in anxiety management may be a significant factor in achieving volleyball success, a factor which has been largely neglected to date.

Chapter 6

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

This study examined the effects of competitive trait anxiety, perceived ability, and perceived success on the attentional styles of volleyball athletes. Two tests were used to assess attention--the attentional portion of Nideffer's (1976a) Test of Attentional and Interpersonal Style (TAS), and a test of volleyball attentional style (TVAS). Anxiety was measured using Martens' (1977) Sport Competition Anxiety Test (SCAT), and perceived ability and success was derived from a personal assessment questionnaire (PAQ). Data gained from these four instruments were utilized to examine the capabilities of the TAS and TVAS to differentiate the attentional style of athletes on the basis of competitive trait anxiety, perceived ability, and perceived success.

Subjects (N = 45) were female varsity college and USVBA "A" caliber or better players who were active volleyball athletes in New York State. These athletes completed the TVAS, TAS, PAQ, and SCAT. As a measure of reliability for the testing instruments, 13 of the athletes were retested 4-6 weeks following the initial test administration.

The TAS consists of 74 items which relate to attentional behavior across a broad range of situations. These situations are based on the six attentional scales developed by Nideffer (1976a) to represent the various types of attentional focus--broad external (BET), overloaded external (OET), broad internal (BIT), overloaded internal (OIT), narrow (NAR), and under-inclusive (RED).

The TVAS is composed of 84 items which represent a variety of attentional demands in the sport of volleyball. Statements were intuitively written based

on the investigator's knowledge of volleyball as a coach and athlete. These situations were based on the six attentional scales developed by Nideffer (1976a).

Internal consistency values ranged from high (.85) to moderate (.59) on the TVAS. High test-retest reliability was found for the TVAS and TAS. Test-retest reliabilities for competitive trait anxiety, perceived ability, and perceived success were high.

As hypothesized, volleyball athletes who reported themselves to be low anxious, of high ability, and successful were significantly different in attentional style as measured on the TVAS than those who were high anxious, of low ability, and less successful. Contrary to the hypotheses, volleyball athletes who reported themselves to be low anxious, of high ability, and successful were significantly different in attentional style as measured on the TAS than those who were high anxious, of low ability, and less successful.

ANOVA was utilized to assess which attentional scales were able to discriminate competitive trait anxiety, perceived ability, and perceived success groups. OET, OIT, and NAR scales of the TVAS were able to differentiate anxiety groups, while the OET and NAR scales differentiated among TAS anxiety groups. The OIT scale of the TVAS was able to differentiate ability groups, while BET, OIT, and RED scales of the TAS differentiated among ability groups. All six TVAS attentional scales were able to differentiate success groups, while only the BET, BIT, OET, and RED scales did so among TAS success groups. With three exceptions, all nonsignificant scales maintained the hypothesized directionality.

Significant between group variance contributions were assessed using discriminant function analysis. RED and BET were the greatest contributors to variance on the TAS, while OIT, OET, and RED largely contributed to the

between group variance on the TVAS. OIT and RED were identified as the attentional scales contributing the greatest amount of overall variance.

Both the TAS and TVAS attentional scales were capable of differentiating high and low anxious, high and low ability, and successful and less successful volleyball athletes. Ineffective attentional scales represented the most important type of attentional behavior in differentiating anxiety, ability, and success groups of female volleyball athletes.

Conclusions

1. Both the TAS and the TVAS attentional scales are able to differentiate volleyball athletes of high and low anxiety, as determined from the SCAT.

2. Both the TAS and the TVAS attentional scales are able to differentiate volleyball athletes of high and low ability, as determined from the PAQ.

3. Both the TAS and TVAS attentional scales are able to differentiate volleyball atheletes who are successful and less successful, as determined from the PAQ.

4. Each of the six attentional scales of the TVAS are able to differentiate among athletes who have been successful and less successful, while only the BET, BIT, OET, and RED scales of the TAS are able to do so.

5. The BET, OIT, and RED scales of the TAS are able to differentiate volleyball athletes of high and low ability, while only the OIT scale of the TVAS is able to do so.

6. The OET, OIT, and NAR scales of the TVAS are able to differentiate volleyball athletes who are high and low anxious, while only the OIT and NAR scales of the TAS are able to do so.

7. The ineffective attentional scales, OET, OIT, and RED, make the greatest contributions to between group variance.

8. The TVAS more accurately identifies female volleyball athletes with ineffective attentional styles than does the TAS.

9. Since the TVAS more accurately identifies ineffective attentional styles, and since an ineffective attentional style prohibits success in volleyball, it is suggested that the TVAS is a better predictor of volleyball performance than the TAS.

Recommendations

1. Tests of attentional style should be developed for other sports using the broad-narrow and internal-external attentional constructs.

2. Future tests of attentional style should be constructed to provide narrow internal and external scales.

3. The TVAS should be administered to volleyball athletes in conjunction with a measure of field-dependence-independence to assess the degree of commonality between the two measures.

4. The TVAS should be administered to volleyball athletes in conjunction with a measure of coincidence-anticipation to assess the relationship between the two measures.

5. The current study should be replicated with a larger sample to help refine the TVAS by increasing internal consistency.

Appendix A

TEST OF ATTENTIONAL STYLE (TAS) ITEMS

1. When people talk to me I find myself distracted by the sights and sounds around me.

2. When people talk to me, I find myself distracted by my own thoughts and ideas.

3. All I need is a little information and I can come up with a large number of ideas.

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

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

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

7. I run back and forth from task to task.

8. I seem to work in "fits and starts" or "bits and pieces."

9. The work I do involves a wide variety of seemingly unrelated material and ideas.

10. My thoughts and associations come so rapidly I can't keep up with them.

11. The world seems to be a booming buzzing brilliant flash of color and confusion.

12. When I make a mistake it is because I did not wait to get all of the information.

13. When I make a mistake it is because I waited too long and got too much information.

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

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

16. In school I failed to wait for the teacher's instructions.

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

18. I think about one thing at a time.

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

20. I theorize and philosophize.

Appendix A (continued)

21. I enjoy quiet thoughtful times.

22. I would rather be experiencing the world than my own thoughts.

23. My environment is exciting and keeps me involved.

24. My interests are broader than most peoples.

25. My interests are narrower than most peoples.

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

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

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

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

30. Happenings or objects grab my attention.

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

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

33. With so much going on around me it is difficult for me to think about anything for any length of time.

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

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

36. I spend a great deal of my time thinking, about all kinds of ideas I have.

37. I figure out how to respond to others by imagining myself in their situation.

38. In school I would become distracted and didn't stick to the subject.

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

40. Even though I'm not hungry, if something is placed in front of me I'll eat it.

41. I am more of a doing kind of person than a thinking one.

Appendix A (continued)

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

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

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

45. I have difficulty shifting back and forth from one conversation to another.

46. I get confused trying to watch activities such as a football game where a number of things are happening at the same time.

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

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

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

50. I can't resist temptation when it is right in front of me.

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

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

53. In school I was not a "thinker".

54. In a room full of people I can keep track of several conversations at the same time.

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

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

57. I make mistakes because I try to do too many things at once.

58. I am good at analyzing situations and predicting in advance what others will do.

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

60. People fool me because I don't bother to analyze the things that they say, I take them at face value.

Appendix A (continued)

61. I would much rather be doing something than just sitting around thinking.

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

63. I am constantly analyzing people and situations.

64. I get confused at busy intersections.

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

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

67. Even when I am involved in a game or sport my mind is going a mile a minute.

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

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

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

71. Sometimes lights and sounds come at me so rapidly they make me lightheaded or dizzy.

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

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

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

Appendix B

ITEM NUMBERS FOR EACH TAS ATTENTIONAL SCALE

Attentional Scale	Item Number
BET	34, 44, 55, 65, 68
OET	1, 7, 8, 11, 29, 30, 33, 35, 46, 56, 64, 71
BIT	3, 20, 24, 27, 34, 51, 52, 70
OIT	2, 10, 19, 28, 47, 59, 69, 72, 73
NAR	4, 6, 14, 18, 25, 26, 28, 29, 31, 32, 43, 49
RED	4, 5, 6, 15, 17, 18, 27, 39, 48, 49, 51, 62, 66, 69, 74

Appendix C

TEST OF VOLLEYBALL ATTENTIONAL STYLE (TVAS) ITEMS

1. I seem to be constantly aware of where the court boundaries are.

2. The opposing spiker consistently beats my attempts to block by hitting the same direction each time.

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

4. The opposing blocker hits the net, but there is no whistle. I glare at the umpire in disgust, forgetting the game.

5. Following a poor first pass, I take charge by calling for and playing the ball, ignoring teammates' efforts to play the ball from poorer positions.

6. I have difficulty playing a ball that is out of bounds and falling near an obstacle such as a wall, guy-wire, or bleachers.

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

8. Two hitters are in my field of vision, one requiring a short set and the other a long set. I fail to decide decisively and set the ball between them.

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

10. If I am blocked early in the game, I dink for the remainder of the game.

11. My teammate and I collide while trying to receive the serve. On the next serve we both move for the ball. I remember our previous collision and hesitate, passing the ball poorly.

12. When I go back to serve, I select a certain player or area of the court as my target and focus my attention there.

13. I constantly "talk to myself" while I am performing.

14. There are moments when I lose track of my teammates' positions during the game.

15. I make a very good net play for side-out and rotate back to serve. I am excited, and serve the ball into the net.

16. I am not taken by surprise when the ball deflects off the block and falls in my defensive area.

17. I can correctly anticipate where each of the opposing hitters will attack.

Appendix C (continued)

18. I try to play the ball even though several teammates call "Out!"

19. I have a mental picture of where my teammates are on the court without looking.

20. When the coach shouts to me during the game my performance declines as I try to listen to the instructions.

21. The opposing setter mishandles the ball badly and I relax, anticipating the whistle. No whistle is blown and their hitter spikes the ball to the floor.

22. I talk or think to myself as I plan my next move. For example, ". . . if the setter backsets, I will be able to hit one-on-one . . . ."

23. I interfere with a teammate's play of the ball by trying to cover more than my assigned defensive area.

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

25. A teammate calls for the ball. I set the ball without thinking and my teammate is easily blocked by the opposing team.

26. I decide to hit the next ball down the line. Even though the set is inside I attempt a line shot and hit out of bounds.

27. I ignore bad calls by the referee and concentrate on making the next play successful.

28. On defense, I recognize what is happening too late to make adjustments.

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

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

31. The setter gives me the signal for the next play. As I make my spike approach, I find that I cannot remember the play.

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

33. I can anticipate what the opposing team will do offensively after their first pass.

34. I am in good position and about to receive the serve when a teammate to my side calls for the ball. I am distracted by this.

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

Appendix C (continued)

36. If our team is behind at match point, excessive pressure to do well causes me to make mistakes.

37. I use the time between games to analyze my team's strengths and weaknesses.

38. I am constantly aware of the opponent's movements as they form an attack.

39. I am more comfortable playing volleyball with only one or two teammates as opposed to six.

40. I recognize a key play and make a key block or dig.

41. It is equally easy for me to concentrate either at home or away.

42. I quickly mentally rehearse the movements explained in our timeout when I return to the court.

43. Faced with only one blocker, I have my choice of shots. I fail to decide positively enough and hit straight into the blocker's arms.

44. When I am slightly injured and continue to play, I tend to make a lot of mistakes.

45. I am placed in a new and unfamiliar position in the line-up. My new responsibilities confuse me and my performance declines.

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

47. I have just been warned by the official. I am very upset, and my performance declines.

48. I am distracted by play in the adjacent court.

49. Early in the game I spike poorly. During a crucial point I tell the setter not to set me.

50. An opponent is about to spike. I remember the hitter's tendency to spike in a certain direction and shift my arms in that direction to block the ball.

51. My performance declines if I leave a favorite piece of equipment or clothing at home.

52. I am ready to serve when my target receiver shifts position. I am distracted by this.

53. When blocking one-on-one, I have difficulty deciding where to block the opposing hitter and am easily beaten.

Appendix C (continued)

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

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

56. I take intentional advantage of openings in the opponent's defense.

57. I have difficulty deciding how and where to serve.

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

59. I scramble to set a ball after a poor first hit. I hear the opponents complaining about a double hit and at the same time notice a hitter out of the corner of my eye. I set the ball poorly.

60. I am able to consistently hit a good shot when faced with a double block.

61. I have played several matches and am tired. During the last game of the day I lose concentration on the game while thinking how good it would feel to sit down or take a hot shower.

62. I constantly monitor or check my position on the court relative to other players, court markings, and the net.

63. I am unaware of my teammates and opponents, other than those in my immediate area.

64. I have been accused of hitting blindly into the block.

65. I can observe the game situation and think ahead.

66. When I am not directly involved in the action, I feel like a spectator.

67. I am able to watch the movements of opposing players and respond appropriately.

68. Playing back-row defense, I can tell where the hitter will place the ball and adjust accordingly.

69. I am about to spike when I remember that the opponents blocked me for a point on the previous two plays. I hit the ball poorly.

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

71. I set to a poorly positioned spiker without thinking.

72. When I am performing I coach myself mentally with instructions.

Appendix C (continued)

73. Following a minor injury I have difficulty concentrating on the game.

74. While playing I am constantly analyzing the game.

75. My friends are watching and I want to impress them by hitting the next ball very hard.

76. Playing back-row defense, I can quickly recognize blockers' mistakes and make up for them.

77. When covering a hitter, I am caught by surprise when the ball is blocked. Consequently I fail to play the ball.

78. I have just spiked for a point or made an exceptional defensive play at a crucial time. I "ease off" afterwards with the feeling that I have earned my place on the court for the rest of the match.

79. I miss an easy hit or dig and I begin to criticize myself. I get an easy chance a minute later but cannot concentrate and I miss again.

80. I remember personality conflicts with another player while on the court.

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

82. I am aware of how plays are developing around me.

83. When playing away from home I may be distracted by the new surroundings, particularly just before or early in the match.

84. My team is losing badly. I begin to do desperate things such as trying to hit a bad set hard for a point, or serve an "ace" every time.

Appendix D

ITEM NUMBERS FOR EACH TVAS ATTENTIONAL SCALE

Attentional Scale	Item Number
BET	1, 14, 16, 17, 33, 38, 56, 58, 60, 63, 64, 67, 68, 76, 77, 82
OET	6, 8, 20, 28, 39, 43, 48, 53, 59, 83
BIT	9, 13, 19, 22, 24, 37, 40, 42, 50, 54, 55, 62, 65, 72, 74
OIT	10, 11, 15, 29, 30, 31, 36, 44, 45, 49, 57, 61, 69, 70, 73, 79, 80, 84
NAR	3, 5, 7, 12, 23, 27, 34, 35, 41, 51, 52
RED	2, 4, 18, 21, 25, 26, 32, 46, 47, 66, 71, 75, 78, 81

Appendix E

PERSONAL ASSESSMENT QUESTIONNAIRE

Name:_____

Institution:_____

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

In volleyball I have been

on winning teams	__ __ __ __ __	on losing teams
unnoticed	__ __ __ __ __	recognized
successful	__ __ __ __ __	unsuccessful
frustrated	__ __ __ __ __	rewarded
happy	__ __ __ __ __	sad
uncertain	__ __ __ __ __	confident

My volleyball 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	__ __ __ __ __	frustrating
strong	__ __ __ __ __	weak
worse than most	__ __ __ __ __	better than most

Appendix F

SPORT COMPETITION ANXIETY TEST ITEMS

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

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