A Psychological Skills Inventory for Sport

Kerry-Ann Wheaton

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Supervisor: Prof. J.R. Potgieter

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Declaration

I, the undersigned hereby declare that the work contained in this thesis is my own original work and that I have not previously in its entirety or in part submitted it at any other university for a degree.

Signature

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Date

Summary

The purpose of this study was to develop a practical, reliable psychological skills inventory to assess the psychological skills of athletes. This primarily involved identifying the relevant psychological skills that affect sport performance. A variety of developmental procedures were applied in the construction of this inventory, including the consultation of sport psychology literature, identification of articles which characterise successful athletes, analysis of research articles pertaining to the psychological skills, and review of available psychological tests. The initial inventory consisted of 82 items which evaluated six psychological skills: achievement motivation, goal setting, anxiety control, maintaining confidence, concentration and mental rehearsal. The inventory was completed by 304 students from the Department of Human Movement Science at the University of Stellenbosch. The respondents' data were divided into two groups depending on their achievement in sport. The results indicated that the inventory was able to differentiate between successful and less successful athletes on the psychological skills measured. Other aspects were statistically analysed, namely language, age, and gender differences, correlation between individual item and achievement level, and the contribution of each item to its psychological skill. The final inventory consists of 60 items, with ten items from each of the six psychological skills. Information obtained from the inventory can identify the strengths, weaknesses and deficiencies in the psychological skills of athletes, so that a psychological skills training programme can be developed.

Opsomming

Die doel van hierdie studie was om 'n praktiese, betroubare sielkundige inventaris te ontwerp om die sielkundige vaardighede van sportlui vas te stel. Dit het hoofsaaklik bestaan uit die identifisering van relevante sielkundige vaardighede wat sportprestasie beïnvloed. 'n Verskeidenheid van prosedures was toegepas in die konstruksie van die inventaris, insluitend konsultasie van sportsielkunde-literatuur, identifesering van artikels wat suksesvolle sportlui beskryf, ontleding van narvorsingsartikels met betrekking tot sielkundige vaardighede en 'n oorsigstudie van relevante sielkundige toetse. Die aanvanklike inventaris het bestaan uit 82 items, wat ses sielkundige vaardighede getoets het, naamlik prestasiemotivering, doelwitstelling, aktiveringsbeheer, handhawing van selfvertroue, konsentrasie en verstandelike oefening. Die inventaris is deur 304 studente van die Departement Menslike Bewegingskunde aan die Universiteit van Stellenbosch voltooi. Die respondente se data is in twee groepe, afhangende van hul prestasie in sport, verdeel. Die resultate het aangedui dat die inventaris tussen suksesvolle en minder suksesvolle atlete onderskei met betrekking tot die sielkundige vaardighede wat gemeet is. Ander aspekte is statisties ontleed, naamlik taal, ouderdom, geslag, korrelasie tussen afsonderlike items en prestasievlak, asook die bydrae van elke item tot sy sielkundige vaardigheid. Die finale inventaris behels 60 items, met tien items van elk van die sielkundige vaardighede. Inligting wat van die inventaris verkry word, kan die sterkpunte en tekortominge van atlete bepaal, wat as basis vir die ontwikkeling van 'n sielkundige program kan dien.

Dedication

- To my family for supporting me in my studies

- To my supervisor, Prof Potgieter, for all his knowledge and guidance

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Chapter one

Statement of the problem

The importance of psychological skills in sport

Talent detection in sport refers to the attempt to match a variety of performance characteristics, which may be innate or subject to the effect of learning or training, to the task demands of a given sport activity to ensure the highest probability of maximum performance outcome. It involves predicting performance by identifying the underlying performance determinants that are necessary to achieve sporting excellence (Regnier, Salmela & Russell, 1993).

The identification of talent is a multidimensional process, with many fundamental factors influencing sport performance. These include physical characteristics, physiological characteristics, skill level, genetic factors, biological age, sociological factors, and psychological factors (Poppleton & Salmoni, 1991; Woodman, 1985).

However, psychology is the critical factor in determining the level of performance because it determines how well the other factors are used (Rushall, 1989). A major tenet of sport psychology is that psychological skills are important determinants of sport performance (Smith, Schutz, Smoll & Ptacek, 1995). Athletes cannot maximise their physical abilities until they learn to master their mental states (Harris, 1985). On a given day in competition the difference between athletic performances may depend on how well the athletes are prepared mentally (May, 1985). Athletes simply do not lose and gain skill and stamina over the course of a single competition in a manner that explains their fluctuations in performance. If the mind is occupied with distracting thoughts that interfere with concentration, it cannot co-ordinate all the necessary factors that contribute to maximal performance (Harris, 1985).

White (1993) examined the relationship between psychological skills, experience and practice commitment among collegiate male and female skiers. Experience and practice commitment did not differentiate collegiate skiers on the psychological skills measured. No significant differences emerged regarding the number of years the subjects had been involved in skiing and number of hours a day they trained. This suggests that to reach an elite level of skiing proficiency, the skiers needed to have knowledge about certain psychological skills.

Smith and Christensen (1995) found in their elite population of professional baseball players, that psychological skills are relatively independent of physical skills, and both are significantly related to performance and survival in professional baseball. Psychological skills are often important outcome variables in performance enhancement intervention programmes. It is important to be able to assess changes in such skills as a means of evaluating programme efficacy (Smith et al., 1995). All athletes must develop their mental skills along with their physical skills if they are to reach their full potential (Harris, 1985).

The purpose in assessing psychological skills

Assessing athletes' psychological skills can provide crucial information concerning the strengths and weaknesses of mental skills and motivation strategies that might be useful for particular performance enhancement interventions (Heil & Henderson, 1996). This enables athletes to identify the factors that interfere with performance, to read bodily cues and to know which ones signal the loss of control, how to concentrate more fully for longer periods of time, how to "switch channels" and refocus when concentration lapses, what his/her optimal level of arousal is, and how to reach it and maintain it throughout a competition, and how to set goals that can be evaluated in a systematic fashion (Harris, 1985). However, it is important to triangulate the results. This means that the testing should be substantiated by other forms of assessment such as observing practices, and attending actual competitions to determine if the message is consistent in each situation. This prevents an

incorrect assessment being made about the athlete (Henschen, 1997). However, according to Udry (1997) numerous studies suggest that observations and interviews are biased projections of the observer or interviewer.

The problem

The problem under investigation in this study is to:

- identify the relevant psychological skills that affect sport performance
- construct a practical, reliable and valid instrument to ascertain the psychological skills of athletes.

Research protocol

The following steps of Thorndike's (1982) test construction plan form the framework for the protocol of this research.

1. An initial definition of the domain or the latent attributes that the instrument is designed to assess.
2. A statement of the uses planned for the instrument, indicating the clientele to be served and types of decisions to be based on it.
3. An indication of the constraints within which the instrument must operate, e.g. constraints of time, media and testing conditions.
4. A set of content specifications, indicating topics to be covered, skills to be tapped, or subabilities to be tested.
5. Specification of the format of test items, indicating the nature of stimulus materials, the type of responses to be made by the athlete and the procedure for scoring.
6. A plan for the tryout of proposed exercises, for analysing the tryout data and for selecting the items to be included in the final instrument.
7. Specification of the statistical parameters that are desired in the completed test, so that it may achieve the required level of reliability.
8. A formulation of the procedures to be used for the standardisation of testing and for carrying out statistical analyses of that testing to prepare test norms.

9. An outline of other data collection and analysis activities that should be carried out to evaluate validity and bias.
10. A plan for the organisation of the test manual or any other needed auxiliary materials.

Chapter two

Related literature

Introduction

Psychological assessment involves any systematic attempt at the measurement of psychological attributes relevant to athletes. Four major areas exist in psychological assessment: clinical (assessment of an athlete with an eating disorder or substance abuse problem), health and exercise (assessment of an individual's motivation to exercise), performance enhancement (assessment of individual athletes' performance-related mental skills), and special assessment topics (selection testing, polygraph testing, head injury assessment, and psychophysiological assessment). Formal assessment devices, such as psychological tests offer a relatively concise, time-efficient, and objective approach to assessing athlete behaviour. Psychological testing can be beneficial to individual athletes, sport teams, and coaches (Heil & Henderson, 1996).

Psychological testing in sport goes back to the work of Coleman Griffith in the 1930s (Kroll & Lewis, 1970). He was responsible for the development of psychological questionnaires and surveys assessing attitudes, perceptions, and personality characteristics of coaches and athletes. *The Athletic Motivation Inventory (AMI)* of Tutko, Lyon and Ogilivie (1969) attempted to bring psychological testing into a sport specific framework. It measured aggressiveness, coachability, and trust in ability.

Research in the 1960s and 1970s resulted in the unsuccessful development of personality inventories or instruments of psychological functioning. Attempts were made to identify the personality differences between athletes at different skill levels (Singer, 1988). These included the *Minnesota Multiphasic Personality Inventory (MMPI)* and the *Catell 16 Personality Factor Questionnaire (Cattell 16PF)* (Morgan & Johnson, 1978). The *Profile of Mood States (POMS)* (McNair, Lorr &

Droppleman, 1971) was commonly used to differentiate successful from less successful athletes according to their mood profiles. However, the predictive power of it has recently been questioned (Rowley, Landers, Blaine Kyllo & Etnier, 1995). The emphasis then moved to the development of sport-specific instruments. For example, the *Sport Competition Anxiety Test (SCAT)* and the *Competitive State Anxiety Inventory-2 (CSAI-2)* have emphasised psychological aspects, such as precompetitive anxiety (Martens, Vealey & Burton, 1990).

The Psychological Skills Inventory for Sports-5 (PSIS-5) arose from the need for an instrument to assess a broad range of psychological skills possessed by athletes. The skills represented cognitive coping strategies to be used in differentiating successful from less successful athletes (Mahoney, Gabriel & Perkins, 1987). Despite its promise as a research instrument it appears to have psychometric shortcomings that limit its potential usefulness (Chartrand, Jowdy & Danish, 1992). It is also possible that the factors currently assessed by the *PSIS-5* are not as closely related to athletic performance as was originally believed. There may be other factors that would account for more of the variance in athletic performance. For example, perceived ability, achievement goal orientations, and self-efficacy are constructs that are worth exploring (Vealey, 1989).

Smith et al. (1995) developed a multidimensional scale that measures seven classes of psychological skills, called the *Athletic Coping Skills Inventory-28 (ACSI-28).* However, it is not assumed that the variables measured exhaust the domain of psychological skills contributing to performance.

However, these studies have been limited in several ways. First, investigators have typically asked athletes to respond to already developed instruments, so there has been relatively little opportunity to identify previously unknown or unhypothesized factors that influence athletic performance. Second, instruments have usually been given only once, typically well before competition, and hence investigators have not assessed athlete reactions to the actual events of the competitive experience. Finally, a need exists to move beyond the

identification of general factors associated with performance success to an in-depth examination of such factors (Gould, Eklund & Jackson, 1992a).

Comparison of successful and less successful athletes

The fact that elite athletes produce superior performances with relative consistency indicates that the majority of them must be doing some things correctly. Not all athletes will behave correctly all the time, but the majority of them will exhibit the appropriate behaviour on most occasions (Rushall, 1979).

The observable difference in performances among athletes of relatively equal athletic skill appears to be determined by the athlete's ability to cope with the perceived stress of the competitive situation. Uncertainty or worry about the competitive events produces anxiety that is manifested in both somatic and cognitive ways. Without regulation of this arousal, anxiety can increase to the point that it disrupts cognitive and physical control in such a way that it interferes with performance (Harris, 1985).

Williams (1986) describes the profile of a champion athlete as follows:

- ability to regulate arousal
- high self-confidence
- good concentration
- perceptions of control
- positive preoccupation with sport
- determination and commitment.

A number of authors have investigated the differences between the psychological skills of successful and less successful athletes (Gould et al., 1992a; Gould, Eklund & Jackson, 1992b; Gould, Weiss & Weinberg, 1981; Highlen & Bennett, 1979; Lufi, Porat & Tenenbaum, 1986; Mahoney 1989; Mahoney & Avener, 1977; Mahoney et al., 1987; Rotella, Gansneder, Ojala & Billing, 1980; Smith & Christensen, 1995; Thomas & Over, 1994; Williams, 1978). The sports covered

included baseball, basketball, bowling, cross-country racing, fencing, field hockey, golf, gymnastics, football, lacrosse, pistol shooting, rifle shooting, rowing, skeet and trap, ski jumping, soccer, softball, speed skating, swimming, tennis, track, volleyball, weightlifting and wrestling. From these studies it appears that successful athletes have characteristic qualities.

They tend to be closer to reaching their maximum potential in their sport (Gould et al., 1981; Highlen & Bennet, 1979; Rotella et al., 1980), and are more confident in their abilities (Gould et al., 1981; Gould et al., 1992b; Highlen & Bennett, 1979; Mahoney & Avener, 1977; Mahoney et al., 1987; Smith & Christensen, 1995).

Concentration is another important predictor of athletic success, with their attention focused only on competition-related thoughts (Gould et al., 1981; Highlen & Bennett, 1979; Lufi et al., 1986; Mahoney et al., 1987; Thomas & Over, 1994; Williams, 1986). Williams (1986) concluded that successful athletes are better able to maintain a task-oriented focus of concentration and are less likely to become distracted. Successful athletes were found to be more positively preoccupied with their sport and less likely to dwell on outcome or failure.

Successful athletes tend to experience higher levels of anxiety anticipating competition than during actual competition (Gould et al., 1981; Highlen & Bennet, 1979; Lufi et al., 1986; Mahoney et al, 1987). This indicates that they use their anxiety as a stimulus to improve performances (Mahoney & Avener, 1977). Rushall, Batty and Gotts (1983) found that the variety of anxiety symptoms tends to be less among better athletes than with lesser skilled athletes. A characteristic of elite athletes is their ability to control their arousal levels before competition. This control enables them to produce appropriate levels of arousal for various levels of performance. Elite athletes are also aware of the different sensations that accompany the varying levels of arousal and their relationships to the consequent level of performance (Rushall, 1979). They focus

on the challenges of the situation, by using their energy positively, rather than in a manner that is detrimental to performance (Harris & Harris, 1984).

Cognitive strategies are employed which enable athletes to have a greater capacity to regain focus once it is lost (Gould et al., 1992b; Thomas & Over, 1994). The successful divers in the study by Highlen and Bennett (1983) thought less about mistakes made earlier in the event. Emphasis is placed on positive thoughts and feelings, unlike less successful athletes who experience negative emotions and cognitions (Mahoney & Avener, 1977; Thomas & Over, 1994).

Elite athletes experience sensations of heightened effort and commitment to the task (Gould et al., 1992b; Thomas & Over, 1994). Mental preparation techniques including preparation routines, a tactical strategy focus and motivational strategies are used (Thomas & Over, 1994). They are also highly motivated to do well in their sport (Gould et al., 1992b; Mahoney, 1989; Mahoney et al., 1987).

A higher frequency of imagery is reported by successful athletes, with internally referenced imagery being preferred to external images (Mahoney & Avener, 1977; Mahoney et al., 1987; Rotella et al., 1980). The images were also clearer and under better control (Highlen & Bennett, 1983). Mahoney and Avener (1977) found that elite gymnastics qualifying for the Olympic team favoured an internal perspective more than did nonqualifiers. Similar findings were found in the study by Rotella et al. (1980) on elite skiers. The better skiers visualised the course, rather than seeing their entire body skiing down the racecourse. Elite athletes also saw themselves performing with a moderate degree of success (Mahoney & Avener, 1977; Mahoney et al., 1987).

Other characteristics of successful athletes include responding positively to frustrating situations (Lufi et al., 1986), experiencing higher levels of automaticity (Thomas & Over, 1994), thinking more about their sport in everyday situations, not blaming their performance failures on external things, for example officials (Mahoney & Avener, 1977), and focusing more of their

attention on their weaknesses and difficulties when planning their strategies (Rotella et al., 1980).

However, Heyman (1982) does point out that a very important relationship exists between the history and selection of athletes, and their later performance. Athletes who are successful throughout the season should be expected to be less anxious about competition and should be more self-confident. This suggests that any assumption about a causal relationship in which psychological patterns or cognitions affect performance be considered carefully.

Gould et al. (1981) designed a sport-specific questionnaire to assess cognitive and behavioural strategies employed by wrestlers as they prepared for or engaged in competition. The anxiety-coping resources most frequently used were having anxiety stimulate positive self-thoughts ("anxiety will help me perform better"), exercising away the tension, rationalising ("others are just as anxious as I am"), and blocking out anxiety ("not thinking about it"). Positive self-talk and attentional focusing were the mental preparation techniques most frequently used.

Successful athletes differ from less successful athletes in the cognitive strategies and skills they employ. When comparing the medalists and nonmedalists, the most important finding derived from the wrestlers' comments was on the degree of automaticity in coping strategies. Non-medal winning wrestlers did not have their coping strategies as well learned or internalised and had to consciously engage them when faced with adversity (Gould, Finch & Jackson, 1993). Medal and non-medal winning wrestlers have also been differentiated in their use of preperformance routines. Medalists were characterised by very systematic preperformance routines that were relatively consistently adhered to throughout the Olympic tournament. Non-medalists reported deviating from their preperformance routines before contests that were considered less challenging or less important or when such routines were inconvenient and only felt the need to mentally prepare to a greater extent for tougher matches. The medalists were

more aware of their optimal feeling state for peak performance and made an effort to get there for each contest. Non-medalists reported increased attention to preperformance routines before all-time best performances whereas medalists did this much less often. Gould et al. (1981) also found that the best performances involved adequate preparation, physically peaking, and handling competitive pressure, while the worst performances were a result of inadequate preparation, and inexperience.

Orlick and Partington (1988) found that mental readiness was an extremely important factor influencing athletic performance. Mental readiness was the only statistically significant factor that was found to be associated with Olympic ranking. Many Olympic athletes did not perform to their potential because they were not prepared for the distractions and unforeseen events occurring at Olympic events. The common success element found among the best athletes, and those who performed to their potential, compared to less successful athletes was the quality of mental preparation for the competition. This included refined precompetiton plans, competitive focus and refocusing plans, and ongoing postcompetitive analyses. Athletes who performed to their potential utilised and adhered to these plans to overcome adversity and distraction, were better able to focus their attention and control performance imagery.

Mahoney and Avener (1977) found that successful gymnasts reported talking to themselves extensively during training and competition, while less successful gymnasts seemed to arouse themselves into near-panic states by self-verbalisations and images that belied self-doubt and impending tragedies. Athletes can also be differentiated in the type of self-talk employed. Highlen and Bennett (1983) found that the more successful divers employed more self-instruction, whereas the less successful divers employed more self-praise.

Peak performance

Peak performance is the prototype of the superior use of human potential; it is more effective, creative, productive, or in some way better than habitual behaviour. It also refers to full use of any human power, and involves a holistic experience of clear focus on the self. The clarity of focus, a strong sense of self, and the awareness of the transaction, share importance with the value and focus on the central object. The self is not lost (Privette, 1983). Peak performance results in personal bests and outstanding achievements (Jackson & Roberts, 1992).

This is in contrast to peak experience (intense joy) and flow (intrinsically rewarding experience). Peak experience seems to have a mystic or transpersonal quality that is not as clearly defined as peak performance or flow. Terms such as "cosmic", "pure psyche", "absolute", and even "ecstasy" are all descriptive of this aspect of peak experience. Flow is fun. It is the structure of the flow activity that largely determines the motivation, the goals and acts of completion, and the action of guidance (Privette, 1983).

A competitive goal orientation may hinder athletes from attaining the necessary psychological state for peak performance to occur. They become distracted by how they are performing relative to others, and focus upon the anticipated outcome of their performance (Privette & Bundrick, 1991).

Jackson and Roberts (1992) provided insight into peak performance by examining relationships between athletes' goals of action, the perception of flow, perception of ability, and the quality of competitive performance. The results indicated that if one adopts a perspective that is self-referenced and mastery-focused, then one may be more likely to achieve a positive performance state. Athletes who were high in mastery orientation experienced flow more frequently than athletes low in mastery. A mastery orientation was often associated with athletes' best performance, and a competitive orientation with worst

performances. Peak performance was found to be associated with flow and this suggests that the state of flow may be necessary for the perception of peak performance. Athletes experienced high levels of flow during their best performance.

Existing instruments

Currently there is a broad range of assessment instruments available to the practitioner. *The Directory of Psychological Tests in the Sport and Exercise Sciences* by Ostrow (1990) contains 175 tests organised into 20 categories. The topics include achievement orientation, aggression, anxiety, attention, attitudes toward sport and exercise, attributions, body image, cognitive strategies, cohesion, confidence, imagery, leadership, life adjustment, locus of control, motivation and sex roles. It formed a useful reference in the search of items when constructing the inventory for this research study. The following instruments were consulted in this research study. Some of the instruments have been deemed to be more important than others, and have been discussed in greater detail.

Measurement of personality characteristics

The *Profile of Mood States (POMS)* (NcNair et al., 1971) is commonly used to measure mental health in athletes. Positive mental health enhances the likelihood of success in sport, whereas psychopathology is associated with a greater incidence of failure. Successful athletes are said to possess an iceberg profile. The iceberg profile refers to the graphic picture that raw scores on the *POMS* create when they are plotted on a profile sheet. If an athlete scores low on "negative" mood scales (tension, depression, anger, fatigue, confusion), and high on the "positive" vigour scale, the plotted curve resembles an iceberg. However, the utility of the *POMS* is questionable in predicting athletic success. Rowley et al. (1995) conducted a meta-analysis on 33 studies comparing the *POMS* scores of athletes differing in success to estimate the magnitude of the findings. Results suggested that across many different sports and levels of performance,

successful athletes only possess a mood profile slightly more positive than less successful athletes.

Measurement of cognitive strategies

The *Competitive Behaviour Questionnaire* was designed as a checklist for athletes to continually monitor their psychological skills. The higher the athlete's score, the more practice is needed in developing them. This questionnaire was developed based on the skills and strategies discussed by Harris and Harris (1984) in their book titled *The Athlete's Guide to Sports Psychology: Mental Skills for Physical People.* The aspects covered include the mind/body integration, learning to hang loose (relaxation), concentration, imagery, self-talk, self-thoughts, and attitudes, goal setting, communication (learning to say what you mean or meaning what you say), staying on track (avoiding obstacles), and monitoring progress (Harris & Harris, 1984).

The *Psychological Inventories for Competitive Rowers* (Rushall, 1975), *Psychological Inventories for Competitive Basketball* (Pound, 1977), and the *Psychological Inventories for Competitive Ice-Hockey* (Lamonica, 1984) each consisting of a series of five psychological tests, and the *Behavioural Inventories for Athletes* (Rushall, 1976), consisting of a series of four psychological tests help the coach identify the best procedures to be used in coaching and handling each athlete. The aspects covered include questions dealing with difficulties experienced at one time or another, reactions to, opinions of, and attitudes about the sport, happenings that are associated with training and competition, acquainting athletes with a host of circumstances which could arise in their sporting experience, and statements about how they feel and act before important competitions.

The *Psychological Skills Inventory for Sports-5 (PSIS-5)* was designed to assess psychological skills that are relevant to elite athletic sport. It contains 45 items assessing five broad themes: anxiety measurement, concentration, self-confidence, mental preparation, and team emphasis, by means of a 5-point

Likert scale (Mahoney et al., 1987). However, Chartrand et al. (1992) in their study of the psychometric characteristics of the *PSIS-5* found several problems with the instrument. The results suggested that more psychometric research is needed before it is used in research or applied purposes. It is suggested that researchers should conduct further item analyses to determine whether specific items are contributing only to the scales they are intending to measure. In its present form, the *PSIS-5* does not meet the factorial validity standards required of a multidimensional instrument that is to be used for research or applied purposes.

A new multidimensional scale, the *Athletic Coping Skills Inventory-28 (ACSI-28)* was developed to measure individual differences in psychological skills within a sport context (Smith et al., 1995). The *ACSI-28* contains seven sport-specific subscales: coping with adversity, peaking under pressure, goal setting and mental preparation, concentration, freedom from worry, confidence and achievement motivation, and coachability. Athletes are asked to read each statement carefully and to recall accurately how often they experience the same thing. Items are scored on a 4-point scale with the following labels: 0 = "almost never"; 1 = "sometimes"; 2 = "often"; and 3 = "almost always". The authors had a general idea of the range of psychological skills they wanted to measure, but no implicit theory. They do not assume that the variables they use exhaust the domain of psychological skills that may contribute to performance. It does appear to be a measure that maps onto a set of several latent variables that conform to current conceptions of important psychological skills. Ultimately, the value of the *ACSI-28* and other important psychological skill measures will be defined by the construct validity they demonstrate in their relations with other meaningful variables (Smith et al., 1995). Definitions of each subscale appear in Table 2.1.

Table 2.1 *Definitions of subscales of the ACSI-28 rating form* (Smith & Christensen, 1995)

Subscale	Definition
Peaking Under Pressure	Is challenged rather than threatened by pressure situations and performs well under pressure; a clutch performer.
Freedom From Worry	Does not put pressure on himself by worrying about performing poorly or making mistakes; does not worry about what others will think if he performs poorly.
Coping with Adversity	Remains positive and enthusiastic even when things are going badly; remains calm and controlled; can quickly bounce back from mistakes and setbacks.
Concentration	Not easily distracted; able to focus on the task at hand in both practice and game situations, even when adverse or unexpected situations occur.
Confidence and Achievement Motivation	Is confident and positively motivated; consistently gives 100% during practice and games and works hard to improve his skill.
Coachability	Open to and learns from instruction; accepts constructive criticism without taking it personally and becoming upset.

Measurement of achievement orientation

The *Task and Ego Orientation in Sport Questionnaire (TEOSQ)* (Duda, 1989) measures tendency toward a task or ego involvement in athletic contexts. Task involvement suggests that perceptions of high ability and subjective success are based on the experience of learning, personal improvement, and task mastery. For example, "I learn a new skill and it makes me want to practice more," and "I work really hard." Ego involvement involves subjective success that stems from the perceptions that one has defeated others and/or demonstrated superior ability. For example, "I can do better than my friends, and "I'm the only one who can do the play or skill." Subjects are asked to think when they felt most successful in their sport, and to respond to 13 items indicative of task or ego orientation. Responses are evaluated based on a 5-point Likert scale, ranging from "strongly agree" to "strongly disagree."

The *Sport Orientation Questionnaire (SOQ)* (Gill & Deeter, 1988) was developed as a multidimensional, sport-specific measure of individual differences in sport achievement orientation. It contains 25 items with three subscales, namely, competitiveness, win orientation, and goal orientation. Competitiveness is the desire to enter and strive for success in sport achievement situations. For example, "I am a competitive person," and "I try my hardest to win." Win orientation refers to the desire to win in interpersonal competition in sport. For example, "Winning is very important to me," and "Scoring more points than my opponent is very important to me." Goal orientation is the desire to reach personal goals in sport. For example, "I set goals for myself when I compete," and "I am most competitive when I try to achieve my personal goals." Subjects respond to each item using a 5-point Likert format, ranging from "never" to "always."

Locus of control

The *Sport Locus of Control (IE) Scale* (Stauss, 1975) measures athletes' perception of the degree of internal and external control that they have over events in the sporting environment, and consists of 31 items. Each item has two

alternatives, of which one must be chosen by the athlete. For example, "Becoming a successful athlete is a matter of hard work; luck has little or nothing to do with it" (internal control), or "Becoming a successful athlete mainly depends on being in the right place at the right time" (external control).

Measurement of anxiety

The *Sport Competition Anxiety Test (SCAT)* (Martens et al., 1990) assesses individual differences in competitive state anxiety, or the tendency to perceive competitive situations as threatening and/or to respond to these situations with elevated state anxiety. The *SCAT* contains 15 items, five of which are spurious items to reduce possible response bias. Subjects are asked to indicate how they generally feel when they compete in sports and games, and respond to each item using a three-point ordinal scale ("hardly ever," "sometimes," or "often"). For example, "Competing against others is fun," and "Before I compete I feel uneasy".

The *Competitive State Anxiety Inventory-2 (CSAI-2)* (Martens et al., 1990) assesses cognitive and somatic components of competitive state anxiety and self-confidence in relation to competitive sport performance. Subjects must respond to the 27 items using a 4-point Likert scale ("not at all," "somewhat," "moderately so," and "very much so"). For example, "I am concerned about the competition," and "I feel nervous".

Measurement of confidence

Bandura (1977, 1986) developed the self-efficacy theory. Self-efficacy is defined as the strength of conviction that one can successfully execute a behaviour required to produce a certain outcome. Bandura has argued that the measurement of self-efficacy cognitions should be conducted in a microanalytic fashion by assessing efficacy along three dimensions: level, strength, and generality. In sport, the level of self-efficacy concerns the athletes expected performance attainment or the number of tasks which can be performed. Strength of self-efficacy determines the certainty with which the athlete expects

to successfully attain each level. Generality refers to the number of domains in which athletes consider themselves efficacious. Assessments of self-efficacy are generally developed with a view to tapping what Bandura terms the "generative capabilities" of the task rather than singular acts that collectively comprise the task (Bandura, 1986). In other words, to assess skiing self-efficacy it is necessary to determine an individual's confidence regarding making crisp turns, negotiating icy moguls at speed, manoeuvring through deep, soft, powder snow, and avoiding or approaching other possible challenges. Simply asking, "How confident are you in your skiing ability?" is insufficient because it fails to address the many components that are relevant to judging skiing self-efficacy.

Previous studies have utilised methods for measuring self-efficacy ranging from single item measures of self-confidence (Gould et al., 1981) and performance expectancies (Scanlan, Lewthwaite & Jackson, 1984), to measures more consistent with Bandura's microanalytic perspective (McAuley, 1985).

In the study by Treasure, Monson and Lox (1996) on wrestlers, special care was taken to ensure that the measurement of self-efficacy was consistent with Bandura's microanalytic approach to assessing self-efficacy. The subjects responded to 10 items representing a multitude of wrestling moves. On a 100-point scale, the athlete rated for each move how successful he was in completing the move against his upcoming opponent. A rating of 100 points indicated absolute certainty, whereas a rating of 0 points indicated no confidence in ability to execute the desired move. Perceptions of self-efficacy were calculated by totalling these certainty ratings across items, and then dividing by the total number of items on the measure. This results in one single efficacy score ranging from 0-100.

The *State Sport-Confidence Inventory (SSCI)* (Vealey, 1986) was developed to assess the belief or degree of certainty athletes possess at one particular moment about their ability to be successful in sport. Questions must be answered based on how confident one feels right now about competing in an

upcoming event. For example, "Compare the confidence you feel right now in your ability to execute the skills necessary to be successful to the most confident athlete you know," and " Compare the confidence you feel right now in your ability to make critical decisions during competition to the most confident athlete you know".

The *Trait Sport-Confidence Inventory (TSCI)* (Vealey, 1986) was developed to assess individual differences in the degree of certainty individuals usually possess about their ability to be successful in sport. Questions must be answered based on how confident one generally feels when competing in sport. For example, "Compare your confidence in your ability to execute the skills necessary to be successful to the most confident athlete you know," and "Compare your confidence in your ability to make critical decisions during competition to the most confident athlete you know".

Both the *SSCI* and *TCSI* contain 13 items and are measured with a 9-point Likert scale, ranging from low, medium, to high confidence. When responding, subjects are asked to compare themselves to the most confident athlete they know (Vealey, 1986).

Measurement of concentration

The *Test of Attentional and Interpersonal Style (TAIS)* (Nideffer, 1976), consisting of 144 items, was designed to serve as a research tool to investigate the theoretical relationship between attentional abilities and performance. These 144 items are grouped into 17 attentional and interpersonal subscales. The interpersonal subscales together with the definition of each appear in Table 2.2.

Table 2.2 *Attentional and interpersonal subscales of the TAIS* (Nideffer, 1976)

Subscales	Definition
Broad external attention	High scores indicate good environmental awareness and assessment skills.
Overloaded by external information	High scores are associated with performance errors due to attending to irrelevant external distractions.
Intellectual expressiveness	High scores indicate a willingness to ask questions and to express one's thoughts and ideas in front of others.
Interpersonal control	High scores are associated with both needing to be in control in interpersonal situations and with actually being in control.
Obsessiveness	This scale reflects speed of decision-making and worry. High scores are associated with increased worry and rumination and difficulty making decision.
Overloaded by internal information	High scores are associated with performance errors due to distractions from irrelevant internal scores.
Narrow-focused attention	High scores indicate the ability to remain task oriented, to avoid distraction, and to stay focused on a single job.

(table continues)

Table 2.2 *(continued)*

Subscale	Definition
Information processing	High scores are associated with a desire for and enjoyment of a diversity of activity.
Reduced-attention	High scores are associated with a breakdown in shifting from an internal focus of attention to an external focus, or vice versa.
Self-esteem	High scores are associated with feelings of self-worth and self-confidence.
Physical orientation	High scores are associated with having been physically competitive, and with enjoying competitive activity.
Negative affect expression	High scores indicate a willingness to confront issues and people, to express one's anger, and to set limits on others.
Broad-internal attention	High scores indicate good analytical and planning abilities.
Behaviour control	High scores are associated with an increased likelihood of "acting out" in impulsive ways and/or a tendency to establish one's own rules rather than strictly adhering to others.

(table continues)

Table 2.2 *(continued)*

Subscale	Definition
Extroversion	High scores indicate an enjoyment of social involvements with others and a tendency to assume a leadership role in social situations.
Introversion	High scores are associated with a need for personal space and privacy and the enjoyment of time alone.
Positive affect expression	High scores indicate a willingness to express positive feelings and support to others.

The instrument can be used to provide valuable information in helping athletes gain greater control over concentration, and to facilitate interactions with others. Poor concentration arises from external overload and internal overload. Athletes with a high external overload make mistakes because they are distracted by irrelevant stimuli such as the presence of spectators, and therefore have difficulty in narrowing attention to the attention which they need. With a high internal overload, concentration is lowered by the athlete's own internal thoughts, such as worrying about the social consequences of defeat. Athletes with high overloads are slow to react through a failure to analyse the opponents' intended strategy from their movements (Nideffer, 1987).

Nideffer's (1976) *TAIS* has been used in the construction of sport-specific versions for tennis, basketball, shooting, baseball, golf, and cricket batting (Slogrove, 1992).

Measurement of imagery

The *Imagery Use Questionnaire (IUQ)* (Hall, Rodgers & Barr, 1990) is a tool for assessing when, where, and how athletes employ imagery to enhance their performance and learning of sport skills. It also demonstrates that athletes at different competitive levels differ in some important aspects in their use of imagery. Subjects must respond to 35 questions using a 7-point Likert scale (1- "never" or "very difficult," to 7- "always" or "very easy"). For example, "To what extent do you use mental imagery in your training?," and "Do you use mental imagery during a practice?". There are also two questions requiring yes/no responses.

Conclusion

Psychological assessment in the form of psychological tests can be very beneficial in sport. They are concise, time-efficient, and objective in assessing athletic behaviour. With the help of the *Directory of Psychological Tests in the Sport and Exercise Sciences* (Ostrow, 1990) a number of assessment instruments were consulted in this research study. For example, the *Profile of Mood States (POMS),* the *Psychological Skills Inventory for Sports-5 (PSIS-5),* the *Athletic Coping Skills Inventory-28 (ACSI-28),* and the *Imagery Use Questionnaire (IUQ).* This was essential in developing an item pool for the inventory.

Chapter three

Methodology

Test plan

Aspects of Thorndike's (1982) test plan procedure were used as the framework for the research. They include the following:

1. **An initial definition of the domain or the latent attributes that the instrument is designed to assess.**

In this study an instrument was designed to assess the psychological skills of athletes.

2. **A statement of the uses planned for the instrument, indicating the clientele to be served and types of decisions to be based on it.**

This instrument is to be used to identify the strengths, weaknesses and deficiencies in the psychological skills of athletes. The results can be used in the development of psychological skills training programmes. This should enable athletes to fully maximise their physical skills through mastery of their psychological skills.

Although it is assumed that the less successful athlete will benefit the most from these results, this does not mean it will not be of use for the more successful athlete. Mahoney et al. (1987) found in his assessment of the psychological skills and exceptional athletic performance that expert sport psychologists tended to view the ideal athlete as having fewer problems or concerns than the elite athletes themselves reported.

3. **An indication of the constraints within which the instrument must operate, e.g. constraints of time, media and testing conditions.**

The instrument must be concise, reliable, ensure the confidentiality of the athlete, and must avoid social desirability.

4. A set of content specifications, indicating topics to be covered, skills to be tapped, or subabilities to be tested.

The instrument must be able to differentiate between successful and less successful athletes on the psychological skills of achievement motivation, goal setting, anxiety control, maintaining confidence, concentration, and mental rehearsal.

5. Specification of the format of test items, indicating the nature of stimulus materials, the type of responses to be made by the athlete and procedure for scoring.

The instrument is a paper and pencil test. Athletes are presented with a number of statements about the experience of competitive sport. Each statement must be read carefully. An indication must then be given as to how they apply when competing in important competitions. It consists of a 5-point Likert scale, with the options of "never," "rarely," "sometimes," "often," and "always." The scoring ranges from "never" (0) to "always" (4). The scoring is reversed for negative items.

6. A plan for the tryout of proposed exercises, for analysing the tryout data and for selecting the items to be included in the final instrument.

The following procedures were followed on the initial administration of the inventory:

The inventory was given to 304 students from the Department of Human Movement Science at the University of Stellenbosch. After the completion of the inventory each student was divided into a level according to their achievement in sports. The levels were then divided into two groups, group one (levels 1.1-1.4) and group two (levels 2.1-2.3) to ease the process of statistical analysis.

Group one

1.1 social

1.2 school

1.3 club

1.4 provincial school

Group two

2.1 national school

2.2 provincial senior

2.3 national senior

The main statistical tool used was *Spearman's Rank Order Correlations*, from the statistical package called *Statistica*. The following aspects were analysed.

- Each item was correlated with the age, year, and achievement level of the student
- The mean scores for gender, language, and the psychological skills of the different achievement levels.

The best 10 correlated items from each psychological skill were included in the final inventory.

All students were required to fill out a three-item anonymous questionnaire to determine their honesty in the completion of the inventory.

7. Specification of the statistical parameters that are desired in the completed test, so it may achieve the required level of reliability.

A test-retest procedure was performed on the final inventory.

8. **A formulation of the procedures to be used for the standardisation testing and for carrying out statistical analyses of that testing to prepare test norms.**

This step will be completed after the instrument has been used at various testing centres nationally.

9. **An outline of other data collection and analysis activities that should be carried out to evaluate validity and bias**

This step also needs to be completed after the instrument has been used at various testing centres nationally. For example, the inventory needs to be correlated with other questionnaires or measures.

10. **A plan for the organisation of the test manual or any other needed auxiliary materials.**

An answer sheet has been compiled to determine the total score each athlete attains on the different psychological skills. This enables the sport psychologist to further investigate those low scoring areas.

Test Construction Procedure

The test construction procedure of numerous psychological tests was analysed. This ensured that the inventory was constructed scientifically.

Generating items

Burisch (1984) examined the issue of which test construction strategy is best to employ during the development of a personality scale. He endorsed an intuitive approach that requires test developers to write or select items that possess intuitive appeal or high face validity for measuring a particular construct. Such items can be used to develop valid and reliable personality scales in a relatively brief time, and the scales are comparable in effectiveness to those developed using factor analytic (internal) or group discriminative (empirical) test construction.

Items must be clearly worded so that they have the same meaning for all respondents. The questionnaires can be administered to pilot individuals to prevent any unclear or ambivalent items (Gill & Deeter, 1988). Shorter questions are preferable to long questions because they are easier to understand. A question must never consist of two or more separate ideas. Technical language and jargon must be avoided. It is important not to bias the answer or lead the respondent to answer in a certain way (Thomas & Nelson, 1985). Tests should also be able to yield data that are unaffected by changes in the meaning of items (Kline, 1986). Terms of frequency and feelings must be avoided (Kline, 1986).

Initial item pools have been constructed using a variety of methods. Items have been constructed by modifying items from various scales (Lamonica, 1984; Martens et al., 1990; McAuley & Courneya, 1994). For example, the *Psychological Inventories for Competitive Ice Hockey* used the following psychological tests in its development: *Sixteen Personality Factor Questionnaire, Psychological Inventories for Competitive Soccer, The Athletic Motivation Inventory, Sport Competition Anxiety Test (SCAT), Psychological Inventories for Competitive Basketball, Psychological Inventories for Competitive Swimming, Psychological Inventories for Competitive Rowers and Psychological Inventories for Competitive Volleyball* (Lamonica, 1984).

Lamonica (1984) observed and noted desirable and undesirable behaviours in the competitive and training situations, and conducted open-ended interviews with past or present hockey coaches. Gill and Deeter (1988) collected open-ended responses from diverse samples of athletes from several exploratory projects conducted by Gill.

A vital aspect in test construction is a review of the literature pertaining to that aspect in sport. This helps to identify the most important psychological features (Gill & Deeter, 1988; Hall et al., 1990; Lamonica, 1984).

A number of tests have been guided by theoretical conceptualisations of what is to be tested. Psychometric development of the *SCAT* was guided by the theoretical conceptualisation of competitive trait anxiety as a situation-specific form of anxiety proneness that mediates, in part, an athlete's perceptions of and/or responses to threat within the competitive process. Several criteria guided the format of the *SCAT* including the need for an objective rather than projective test, the need to minimise response bias, the desirability of unambiguous administration procedures, a short completion time, and easy scoring procedures (Martens et al., 1990).

A similar procedure was followed in the development of the *Test of Attentional and Interpersonal Style (TAIS).* The 17 aspects of attentional and interpersonal style were identified by various theoretical formulations. This involved developing a pool of unambiguous items, reflecting behavioural experiences in the 17 areas considered important for predicting performance and making specific treatment recommendations (Nideffer, 1976).

Measurement scales

There are a number of scales that can be used in an inventory. These include Thurston scales, Guttman scales and Likert scales. The Likert scale is preferable to the other two scales because serious problems exist which render them dubious (Kline, 1986).

A Likert scale consists of a collection of statements. Subjects have to indicate their response to every statement on a five or seven point scale. Reliability increases with the number of scale steps, and decreases sharply at seven. Its popularity stems from the fact that it is easy to compile (Huysamen, 1994; Kline, 1986).

Self-report measures of psychological skills are normally quite transparent. Athletes can respond in a manner to present either a positive or negative image

of themselves. This results in response distortion. There are a number of ways to reduce this from happening. The test should contain roughly half positive and half negative statements. Several measures can be taken. First attempts may be made to enlist the co-operation of the participants and to induce them to respond honestly. Response distortion is less likely to occur when participants are not asked to identify themselves (Huysamen, 1994; Kline, 1986; Smith et al., 1995).

Number of items and subjects

Roughly twice as many items as what are needed for the final inventory need to be drawn upon in the initial test construction, with 20 items usually being sufficient for reliability (Kline, 1986). Nideffer (1987) suggests that there should be 10 subjects for each predictor variable. This is very important if statistical significance is to be achieved. The smaller the number of subjects, the greater the amounts of variance that must be accounted for before results are deemed significant.

Dealing with preconceptions

It is important when testing to be sensitive to the preconceptions that the athlete may carry into the testing situation and to explain the limitations inherent in testing. Results should be provided in a language that is understood by the athlete and coach with possible examples, preferably from the athlete's sport. The athlete must also be given the opportunity to ask follow-up questions later (Heil & Henderson, 1996). It is important to always reveal to the athletes being tested what you plan to do with the cumulative results and ask permission to do so. It is also vital to respect confidentiality issues if they arise (Henschen, 1997).

Construction of tests

Various methods exist in the construction of psychological tests.

The *Athletic Coping Skills Inventory-28* was developed by means of a psychometric strategy that involved the use of confirmatory factor analysis to derive subscales that conform closely to an underlying structural model of psychological skills (Smith et al., 1995).

An item analysis procedure based on a sample of 312 undergraduates was used to develop the 17 rationally defined *TAIS* subscales. Each subscale item was correlated with its total subscale score, correcting for the item's inclusion in the total score (Nideffer, 1976).

The development of the *Trait Sport-Confidence Inventory (TSCI)* and the *State Sport-Confidence Inventory (SSCI)* involved the assessment of the internal structure of the inventories, individual item characteristics, and the degree to which social desirability influenced responses to the inventories. Factor analysis was used to determine if they measured unidimensional or multidimensional constructs. This was then replicated using the modified versions of the *TSCI* and the *SSCI* to examine the individual item characteristics, social desirability, response bias, and internal consistency. Item discrimination analyses were also performed to examine how well each item in the inventory differentiated between high and low sport-confidence (Vealey, 1989). This was also a major concern in the development of the *Sport Orientation Questionnaire (SOQ)* (Gill & Deeter, 1988).

The *Psychological Skills Inventory for Sports* (Mahoney et al., 1987) was developed in as simple and quick a way as possible. Each question permitted a true/false distinction for the respondents. It was employed as a pilot instrument in search of the primary research goal which was the identification of skills or clusters that reliably differentiate elite athletes from their less exceptional peers, and a comparison of the psychological skill profiles reported by elite athletes and predicted by sport psychologists in the depiction of the ideal athlete. The *Physical Self-efficacy scale* was developed in a similar fashion when a pool of 90

items were subjected to a principle factor analysis to identify meaningful clusters (Ryckman, Robbins, Thornton & Cantrell, 1982).

Validity

During the development of the questionnaires various procedures are followed to assure their validity, reliability, and objectivity.

Various tests have used panels of experts or sport psychologists to verify their validity. Lamonica (1984) used experienced hockey coaches, technical directors, and researchers specialising in ice-hockey to assess both content and empirical validity. The initial item pool for both the *TSCI* and the *SSCI* (Vealey, 1989) were reviewed by four judges with an extensive background in sport psychology. Judges evaluated the face or content validity of each item as well as its clarity concerning sentence structure. From the judges' evaluations, items not meeting these criteria were eliminated.

The items for the *Subjective Exercise Experiences Scale* (McAuley & Courneya, 1994) were mailed to seven expert judges, all doctoral level researchers in the area of psychosocial responses to exercise and physical activity. The judges were asked to indicate the suitability of each item as a subjective experience likely to be influenced either positively or negatively by exercise participation. For an item to be retained for the next stage of scale development, the item had to be identified by at least six of the seven judges as influenced by exercise.

The 58 items generated initially for the *SOQ* (Gill & Deeter, 1988) were circulated to five raters, all graduate students in an advanced sporty psychology seminar, who rated each item on content and clarity. All raters were quite familiar with the general achievement motivation literature and related "sport psychology" work. Only items that were rated as definitely clear and representative of sport achievement orientation by all five raters were retained.

Other questionnaires that consulted experts in their construction included the *Imagery Use Questionnaire* (Hall et al., 1990) and the *Competitive State Anxiety Inventory-2* (Martens et al., 1990).

The American Psychological Association (1985) *Standards for Educational and Psychological Testing* recommend that self-report inventories be first validated by demonstrating concurrent validity with previous validated scales. To assure concurrent validity Martens et al. (1990), Nideffer (1976), Ryckman et al. (1982), and Smith et al. (1995) have correlated their questionnaires with other measures.

Construct validity can also be determined by testing the adequacy of the hypothesised relationships between the construct being validated and other constructs in the theoretical model (Vealey, 1989; Walling, Duda & Chi, 1993).

Reliability

Most tests have obtained reliability coefficients by performing a test-retest. This is obtained from scores of the same person on different administrations of the inventories (Gill & Deeter, 1988; Lamonica, 1984; Martens et al., 1990; Nideffer, 1976; Ryckman et al., 1982; Vealey, 1988).

Method

The following procedures was applied in this study:

- sport psychology literature was consulted to identify the psychological skills most commonly covered by the authors
- articles was consulted which identified the characteristics of successful athletes, and how they differed from their less successful counterparts
- each of these areas was further investigated through a thorough analysis of research articles

- currently available psychological tests was reviewed for suggestions concerning psychological concepts, ideas and items that might be applicable for use in the inventory, as well as their method of test construction.

Chapter four

Identification of psychological skills to be included in the inventory

Sport psychology literature was consulted to determine the most generally identified psychological skills. Each of these psychological skills were then further analysed. After each psychological skill discussion a summary follows which gives the reasons why particular items have been included in the inventory. The items appear in italics. The psychological skills which will be covered include:

- achievement motivation
- goal setting
- anxiety control
- maintaining confidence
- Concentration
- mental rehearsal
- coping strategies.

Of these seven psychological skills, the first six formed the basis of the inventory. Coping strategies did not warrant a separate category due to their diverse nature. However, they were included in other categories.

Achievement Motivation

The term motivation comes from the Latin word "movere" meaning to move, and describes the forces within us that activate us to direct behaviour in a certain way (Terry, 1989). It is an abstract concept only observable from the resultant behaviour and measurable by imperfect devices. Motivation is the tendency to carry out a particular set of behaviours. When these tendencies are seen to be carried out intensively or maintained for a long time, it is inferred that there is a strong level of motivation (Howe, 1986).

Achievement motivation is the tendency to strive for success, persist in the face of failure, and experience pride in accomplishments. Because achievement motivation has been considered a personality factor, sport psychologists have viewed it like personality, progressing from a trait-oriented view of a person's "need for achievement" to an interactional view that emphasises more changeable achievement goals and how these affect and are affected by the situation. Achievement motivation in sport is popularly called competitiveness. In sport and exercise psychology achievement motivation focuses on self-competition, whereas competitiveness influences behaviour in socially evaluative situations (Weinberg & Gould, 1995).

Achievement motivation and competitiveness deal not just with the outcome or the pursuit of excellence, but also with the psychological journey of getting there. An athlete's competitiveness and achievement motivation influence a wide variety of behaviours, thoughts and feelings, such as the following:

- choice of activity (seeking out opponents of equal ability to compete against or looking for athletes of greater or lesser ability to play with)
- effort in pursuing goals (how often does the athlete practise)
- intensity of effort in the pursuit of goals (how consistently hard the athlete tries during a workout)
- persistence in the face of failure (when the going gets tough does the athlete work harder or take it easier) (Weinberg & Gould, 1995).

Achievement motivation theories

Three theories can be identified which explain what motivates people to act.

1. Achievement need theory

Five components make up this theory: personality factors or motives, situational factors, resultant tendencies, emotional reactions, and achievement-related behaviour. There are two underlying achievement motives: to achieve success and to avoid failure. The motive to achieve success is defined as the capacity to experience pride or satisfaction in accomplishments, whereas motive to avoid

failure is the capacity to experience shame or humiliation as a consequence of failure. High achievers demonstrate high motivation to achieve success and low motivation to avoid failure. They enjoy evaluating their abilities and are not preoccupied with thoughts of failure. Low achievers demonstrate low motivation to achieve success and high motivation to avoid failure. They worry and are preoccupied with thoughts of failure. Situations must also be considered. Two primary considerations are the probability for success in the situation or task and the incentive value of success. The third component is the resultant or behavioural tendency derived by considering an athlete's achievement motive levels in relation to situational considerations. This theory is best at predicting situations where there is a 50-50 chance of success. High achievers seek out challenges in this situation because they enjoy competing against others of equal ability or performing tasks that are not too easy or too difficult. Low achievers avoid such challenges, instead opting either for easy tasks where success is guaranteed or for unrealistically hard tasks where failure is almost certain.

Both high and low achievers want to experience pride and minimise shame, but their personality characteristics interact differently with the situation to cause them to focus more on pride or shame. High achievers focus more on pride, whereas low achievers focus more on shame and subsequent worry.

The fifth component of the need achievement theory indicates how the four previous components interact to influence behaviour. High achievers select challenging tasks, prefer intermediate risks, and perform better when evaluated. Low achievers avoid challenging tasks, avoid intermediate risk and perform worse when evaluated (Weinberg & Gould, 1995).

2. Attribution theory

Attribution theory focuses on how athletes explain their successes and failures. Athletes attribute their success and failures to a variety of factors. The most basic attribution categories are permanent stable factors (e.g. ability), unstable or temporary factors (e.g. luck), internal to the individual (e.g. effort), external

(e.g. weak opponents), under control of the individual, or beyond one's control. Attributing performance to certain types of stable factors (high ability) has been linked to expectations of future success. Strong competitors tend to ascribe to stable, internal factors such as their own ability. They tend to feel that they are in control of situations. They attribute failures to external unstable factors. Attributions to internal factors and to factors in our control (ability or effort) rather than to external factors or factors out of our control (luck or task difficulty) often result in emotional reactions like pride and shame (Weiner, 1985).

3. Achievement goal theory

Achievement goal theory examines motivation from the perspective of the goals athletes pursue in achievement contexts. Athletes engage in achievement contexts to determine competence. Three factors interact to determine an athlete's motivation: achievement goals, perceived ability, and achievement behaviour. Two conceptions of ability exist and manifest themselves in achievement contexts. A task-involved athlete requires an undifferentiated conception of ability, where ability is not differentiated from effort and is construed as improvement. An ego-involved athlete requires a differentiated concept of ability, where ability is not differentiated from effort, but is differentiated from each other, and ability is construed as capacity (Nicholls, 1989).

A task-orientation focuses on comparing performance with personal standards and personal improvement. An ego-orientation focuses on comparing performance with, and defeating others (Duda, 1993; Roberts, 1993).

The predominant goal perspective held by an athlete at a given achievement context is a function of the interplay between dispositional and situational factors. Dispositions are individual difference variables that determine the priori probability of adopting a particular goal and displaying a particular behaviour pattern, and situational factors are seen as potentially altering these

probabilities (Dweck & Leggett, 1988). Ames (1992) used the term motivational climate to refer to the situational goal structure, and has adopted the terms mastery and performance to refer to task- and ego-involving achievement situations, respectively. The motivational climate of a context involves specific cues that make salient a mastery (task) or a performance (ego) goal or both. Situations that emphasise interpersonal competition, normative feedback, public evaluation, and social comparison facilitate ego involvement, whereas contexts that encourage effort, learning, mastery of the task, and participation foster task involvement.

Jourden, Bandura and Banfield (1991) assessed the impact of conceptions of ability on self-regulatory factors and motor skill acquisition on a group of psychology students. The results indicated that those who performed the task under the conception of ability as an acquirable skill displayed a growth in perceived self-efficacy, positive self-reactions to their performance, widespread interest in the activity and a high level of skill acquisition, while those subjects who performed the task under the inherent-aptitude conception displayed no growth in perceived self-efficacy across phases, had negative self-reactions to performances, low interest in the activity, and a limited level of skill development.

Duda and White (1992) examined the relationship between goal orientations and beliefs about the causes of success among elite skiers. The skiers completed the *Task and Ego Orientation in Sport Questionnaire* specific to skiing and a questionnaire assessing their perceptions of the determinants of success in skiing. Hard work and practice were viewed as a means to skiing success only among athletes who scored high in task orientation. The belief that training and the desire to improve and to do one's best help foster success was not shared by the skiers who were highly ego orientated. They were more likely than high task-oriented skiers to believe that taking an illegal advantage, possessing and ensuring that one demonstrates athletic ability and external variables result in athletic success. Elite skiers with a strong task orientation realised that one

needs skill and ability to get ahead in competitive skiing, but they also were cognisant of the influential role of hard work and practice. The ego-oriented person (in which uncontrollable elements such as ability and external factors, and not exerted effort are deemed critical) might experience some motivational problems in the long term.

Seifriz, Duda and Chi (1992) found that a perceived mastery-oriented climate corresponds with greater intrinsic interest in basketball. Athletes who perceived team climates that were characterised by a focus on personal improvement, trying one's best, and maximal participation enjoyed playing basketball more. When behaviours that coincide with a mastery-oriented climate were perceived to be reinforced on a team, athletes tended to believe that applying effort was more likely to help them reach success in basketball. Perceptions of a performance-oriented climate were predicted to positively relate to the belief that ability causes success.

Newton and Duda (1993) found that elite adolescent tennis players tend to ascribe to the belief that effort played a key role in causing success in tennis and that they were primarily task oriented. The results indicated those tennis players who judge their competence and define success with respect to personal mastery tend to view tennis as an arena in which working hard, staying within the rules, and relying on one's resources and effort will lead to success.

Task orientation corresponded to a greater total score on the *Intrinsic Motivation Inventory* for a group of undergraduate students enrolled in college-level tennis classes. Ego orientation related to less intrinsic motivation. Those high in task orientation tended to enjoy their sport more, find the sport more interesting, reported that they worked hard while playing, and that their participation is important. Ego orientation was not significantly related to scores on the effort/importance subscale (Duda, Chi, Newton, Walling & Catley, 1995).

Kavussanu and Roberts (1996) found that perceptions of a mastery motivational climate were associated with enjoyment, effort, perceived competence, and low tension, while perceptions of a performance climate were linked to high tension. Those students who perceived their class climate to emphasise personal improvement and skill mastery were more likely to focus on the intrinsic rewards of learning, enjoyed participation in the tennis class more, exerted more effort and had higher perceived competence. Individuals who viewed their class climate as stressing social comparison and competition with fellow classmates, felt more pressure during participation in the activity. Motivational climate was also a significant predictor of self-efficacy, whereas dispositions did not contribute to self-efficacy predictions. Mastery experiences provide the most important source of self-efficacy experience.

Achievement motivation summary

An athlete's competitiveness and achievement motivation influence a wide variety of behaviours, thoughts and feelings, such as the following, choice of activity, effort in pursuing goals, intensity of effort in the pursuit of goals, and persistence in the face of failure.

Three theories have been discussed with respect to achievement motivation in sport: achievement need theory, attribution theory, and achievement goal theory.

The following items have to do with how athletes perceive their motivation.

- *I am good at motivating myself.*
- *I am motivated to excel in my sport.*
- *I am a tough competitor.*
- *My sport is the most important activity that I do.*

The attribution theory focuses on how athletes explain their successes and failures. Attributing success to factors out of our control, such as luck, in the

following item can result in athletes experiencing negative emotional reactions such as shame.

- *Luck plays an important part in my sporting achievements.*

The achievement goal theory examines motivation from the perspective of the goals athletes pursue in achievement contexts. Two conceptions of ability exist and manifest themselves in achievement context, namely task involvement and ego involvement. Task-involved athletes are expected to work hard, choose challenging tasks, perform optimally, and persevere when faced with obstacles and frustrations. Ego-involved athletes focus on comparing performances, and defeating others. Maladaptive achievement patterns are hypothesised to relate to ego involvement when athletes are not confident in their ability. Ego-involved athletes who have low perceived ability are expected to experience performance impairment, withhold effort or report a lack of interest when it seems that they will appear incompetent, select tasks that are too easy or too difficult, and/or quit when the possibility of repeated failure exists. Even among the already confident athletes, an emphasis on ego-involved goals is hypothesised to lay the basis for forthcoming achievement related difficulties. The following items emphasise aspects from the achievement goal theory, with special emphasis on whether the athlete displays a task-involved orientation and not an ego-involved orientation.

- *Winning in sport is very important to me.*
- *I prefer easy contests to difficult contests.*
- *I can persevere at my sport, even when I am very tired.*
- *I would miss a training session if another interesting opportunity arose.*
- *If the odds are against winning, I am still able to produce my best effort.*
- *If I fall behind in a competition I feel that winning is impossible.*
- *I am able to bounce back after a disappointing performance.*
- *I strive for better performances.*

- *I look forward to important competitions.*
- *I am enthusiastic at practice sessions.*

Successful athletes are closer to reaching their potential as performers, while less successful athletes feel that they could have performed better, as indicated in the following item.

- *After the competition is over, I feel that I could have performed better.*

Goal setting

A goal can be defined as a specific level of proficiency on a task, usually attained within a specific time (Weinberg, 1996). The basic assumption of the goal-setting theory is that task performance is regulated directly by the conscious goals that athletes are trying for on a task. Goals are immediate regulators of human action. They operate largely through internal comparison processes and require internal standards against which to evaluate ongoing performance (Weinberg, 1996). Goal setting is dynamic in that standards are raised with progress in performance. The pursuit of goals is generally a mixture of successes and failures (Harris & Harris, 1984). All dimensions of motivation, attentional focus, effort put forth, the persistence of effort, and continued development of relevant strategies to attain goals are structured through goal setting (Harris, 1985). Goal setting can also be used to enhance self-efficacy. Bandura's self-efficacy theory (1977) proposes that goal achievement provides the strongest possible source of efficacy information that is available to athletes.

Sport psychologists do not typically have a problem getting athletes to set goals. Rather, they have difficulty getting athletes to set the right kind of goals; goals that enhance motivation (Weinberg, 1996). Findings from the work of Weinberg, Burton, Yukelson and Weigand (1993) indicate that athletes found their goals to be moderately to highly effective. Common problems which exist when setting goals include, failing to monitor goal progress and readjust goals, failing to

recognise individual differences, failing to set specific measurable goals and setting too many goals at the start (Weinberg, 1996). A key factor in goal setting is that the athlete must accept and be committed to the goal (Hardy & Nelson, 1988).

Types of goals

Two types of goals can be identified: process and outcome goals.

Process goals are based on attaining challenging personal performance standards that provide the flexibility and control needed to develop high perceived ability, positive competitive cognitions and consistent performances. Athletes who are more concerned with performing well in their sport appear more self-confident and less anxious and may perform closer to their potential (Martens, 1987).

Outcome goals such as winning lack the flexibility and control necessary to ensure success (Burton, 1989). Outcome goals can reduce motivation in two ways. If athletes are substantially less skilled, they may try just hard enough to win. In contrast, when the athlete is superior, they know that winning is unlikely, and they may not put forth their best effort (Martin & Gill, 1991). Low self-confidence, high anxiety, and, ultimately poor performance is often noted in athletes who hold outcome goals, especially if the competition is superior (Martens, 1987). However, if an outcome goal is salient, an athlete might exhibit normal or high levels of state sport-confidence (Martin & Gill, 1991).

Many athletes and coaches at the lower levels of competition refuse to accept the idea that a process focus can enhance performance more than an outcome focus. The findings by Vealey (1988) indicated that elite athletes were more process-oriented than college and high school athletes. Process goals have been recommended for use in applied environments (Cox, 1994), based on Burton's

(1989) study, but a direct comparison was not made between process and outcome goals to warrant such a conclusion.

Why goal setting works

There are two ways to explain how goals influence behaviour: the direct mechanistic view and an indirect thought process view.

The direct mechanistic explanation specifies that goals influence performance in one of four direct ways. First, goals direct the athletes attention to important elements of the skill, which may not normally be attended to. Goals also mobilise effort and persistence by providing incentives. They prolong persistence, and finally, goals foster the development of new learning strategies (Locke & Latham, 1985).

The indirect thought process explanation proposes that goals influence performance indirectly by affecting an athletes psychological state, including such factors as confidence level, anxiety, and satisfaction (Burton, 1989).

Goal setting principles

The correct application of the following principles provides a strong foundation for designing a goal-setting programme (Cox, 1994; Gould, 1986; Harris & Harris, 1984; Rushall, 1979; Terry, 1989; Weinberg, 1996; Weinberg & Gould, 1995).

1. Set specific and measurable goals

Goals should be stated in very specific, measurable, and behavioural terms. Objective evaluation criteria and performance limits should be stated where possible. For example, a goal to improve one's golf game is too vague. A better goal would be to lower the golf handicap from 14 over par to 11 over par by improving the accuracy of the tee shots.

2. Set realistic but challenging goals

Goals are of little value if no effort is needed to achieve them, but goals that are too difficult to achieve lead to frustration, reduced confidence, and poor performance.

3. Set both long- and short-term goals

Short-term goals provide the small, regular experiences of success and keep the athlete motivated. Without them athletes often lose sight of their long-term goals, and the progression of skills needed to obtain them. Long-term goals may be focused over an entire season, career, etc.

4. Set goals for practice and competition

Setting goals for a practice setting is important because most athletes report that it is easier to be motivated for a game or match, whereas additional motivation is often needed for daily practise.

5. Write goals down.

Once goals are set they should be recorded and placed where they can be seen easily, otherwise they can be forgotten. Writing the goals down means that the athlete has thought through the process of meeting the objectives. It increases the clarity of the goals and provides a reference for all types of goals. The greatest advantage of keeping a written record of progress towards goals, is that of providing regular feedback, and enhancing motivation.

6. Develop goal achievement strategies

Strategies must be developed to accompany the goals set. It is important that all factors related to goal attainment be taken into account. If a goal is set for improving percentage jump shots in basketball a need may exist to increase arm and shoulder strength. As a result, goals might have to be established relating to strength building through weight training to attain the primary goals.

7. Set individual and team goals

Individual goals should not be in conflict with team goals or in conflict with other team-mates' goals. Individual and team goals must be compatible for success to follow.

8. Provide support for goals

It is important to enlist support from significant others to make goal setting effective.

9. Provide for goal evaluation

Performance feedback about progress is essential if goals are going to effectively change performance and behaviour. Goal evaluation strategies should be initiated at the start of the goal-setting programme.

10. Where there is more than one goal, establish priorities and guidelines should be established for resolving goal conflicts

The attainment of one goal must not prevent the attainment of another. Too many goals must not be set because energies can be dispersed or become less focused.

11. Set structured time frames or target dates for goals

Without the aid of target dates, there is no measurable way to determine the progress toward the desired behaviour.

12. Set positive rather than negative goals

Goals can be set in either positive (e.g. increasing the percentage of good serves in a tennis match), or negative (e.g. decreasing the percentage of bad serves in a tennis match) terms. Although it is sometimes necessary for athletes to set goals in negative terms, it is suggested that whenever possible, goals should be stated positively. Behaviours must be identified which can be exhibited as opposed to behaviours that should not be exhibited. This helps athletes focus on success and not on failure.

A number of factors act as mediators between personal goal setting and performance. These factors are self-satisfaction, previous performance, and self-efficacy. In helping athletes to choose or to attain their goals, coaches should work with self-efficacy and self-satisfaction strategies. Also feedback of previous performance is needed. Athletes should participate in setting their goals because this is likely to increase their actions (Theodorakis, 1995). The higher the perceived self-efficacy and the higher the prior accomplishments, the more challenging goals are set (Bandura & Jourden, 1991).

Goal setting research

The beneficial effect of goal setting has not been proven in the sport domain, as well as it has been done in the industrial psychology research. Due to this occurrence Blaine Kyllo and Landers (1995) conducted a meta-analytic review of the literature investigating the effects of goal setting on performance in sport and exercise. The following assumptions were hypothesised for performance in sport and exercise:

- difficult goals will result in greater performance gains compared with "too easy," "do your best," or "no goal" comparison groups
- specific goals will result in greater performance gains compared with "too vague," "general," "do your best," or "no goal" comparison groups
- short-term goals combined with the long-term goals will result in greater performance gains than will long-term goals alone.

The results indicated that, overall, setting goals improves performance in sport and exercise, regardless of whether the comparison group is a "no goal" control, or a "do your best" control. Difficult goals did not increase performance more than easy "do your best," or "no goals," as predicted by Locke (1991). Only moderate goals, those in which attainment was between 10 and 50 percent, resulted in a mean effect size significant from zero. This may be due to the improper definition of difficulty. The hypothesis that specific goals would lead to greater performance than "vague," "general," or "no goals" was only partially

supported. Although relative goals (based on individual performance) can enhance performance, they are no more successful than "vague" ("do your best") goals. The greatest improvement came from absolute goals (all treatment group members were working toward the same goal) (Blaine Kyllo & Landers, 1995).

However, the mean effect size for absolute goals was based on the results of only six studies. Absolute and relative goals are similar to Burton's (1989) outcome and process goals. Short-term goals and combined short- and long-term goals had mean effect sizes that exceeded the mean effect size associated with long-term goals (Blaine Kyllo & Landers, 1995).

There are a number of additional variables that can influence the goal-setting/performance relationship. Goal setting seems to be more effective at improving performance in sport when individuals are allowed to set, or at least participate in setting the goals. Public goals seemed to be associated with a mean effect size significantly larger than private goals. Competition among athletes leads to low goal acceptance, because competition may be a form of goal setting (Blaine Kyllo & Landers, 1995). Lerner and Locke (1995) found that face-to-face competition did not raise commitment when the assigned goal was controlled. However, it must be noted that simultaneous competition may be more arousing than sequential competition. In competitive sports, the goals are the performance levels of the athlete's one is competing against. These are constantly changing, usually in an upward direction.

Several studies on goal setting in sport and exercise psychology have obtained null results, as a result of methodological flaws. Common problems that are found are the following.

1. Manipulation failure of "do- best" condition

When athletes are given feedback about their past performance, they may use it to set specific goals. This means that athletes in the "do-best" condition, if given feedback about their past performance, may use it to set specific goals for

themselves unless they are specifically prevented from doing so. When "do-best" athletes either, for some reason, do not set goals or are prevented from doing so, then the specific, hard goals versus "do-best" goal differences emerge.

2. Make specific goals difficult

To know how an athlete will perform, it is imperative to know what personal goal each athlete sets in response to the goal that was assigned. Assigned goals affect performance through their efforts on personal goals. Even knowing that an athlete is not committed to an assigned goal is not very helpful unless one knows what goal was substituted for the assigned one.

Goals should be set so that no more than 10 percent of the athletes can reach them. Goal theory does not claim that specific goals lead to better performance than "do-best" goals. The specific goals must also be difficult. Specific goals that are easy lead to the same level of performance than do "do-best" goals; moderate goals usually lead to the same level of performance as do "do-best" goals.

3. Commitment

Commitment has normally been measured with a one-item measure (goal acceptance). Commitment measures are not a substitute for personal-goal measures, but rather a supplement. Commitment reveals if the athlete has accepted the assigned goal; a personal goal reveals what new, personal goals have been set.

4. Competition

If competition does occur, the other athlete's performance becomes the goal and thus must be measured.

5. Measure self-efficacy, not subjective difficulty or effort

Subjective-difficulty measures predict performance quite poorly, because high goals are seen on average, as harder to reach. The more ability one thinks one has, the easier a given goal appears to be. As a result, the objective-difficulty

measures and perceived-ability aspects tend to cancel one another out. Self-efficacy measures focus on performance, not on the probability of succeeding at a goal, and is thus not confounded by goal level (Locke, 1991).

However, Weinberg and Weigand (1993) do not believe that the inconsistent results concerning the goal-setting/performance relationship can be attributed totally to methodological flaws as Locke (1991) concludes. They recommend that researchers must determine what kinds of goals are most effective for different athletes, performing different tasks, under different conditions, and not simply whether goal setting can enhance performance.

Goal setting summary

Although there have been discrepant findings regarding goal setting in sport and exercise psychology, recent research has demonstrated that setting goals improves performance (Blaine Kyllo & Landers, 1995). The goal-setting principles discussed earlier form the basis of the proposed inventory items. After each item the principle number appears in brackets. Two items were not included from the principles, *"I set goals for my sport,"* and, *"I, myself, set my goals for my sport."* It is necessary to determine if athletes set goals for their sport. Goal setting is more effective when athletes participate in setting goals for themselves. The following items constituted the psychological skill of goal setting.

- *I set goals for my sport.*
- *On a daily or weekly basis I set very specific goals for myself that guide what I do. (3)*
- *I set realistic, but challenging goals for my sport. (2)*
- *I tell other important people what my goals are. (8)*
- *I write down goals for my sport. (5)*
- *I monitor the progress towards my goals. (9)*
- *I set specific goals for each practice session. (1+4)*
- *I set specific goals for every competition. (1+4)*

- *My specific goals are structured to lead me to my eventual long-term goal. (6)*
- *My goals all have deadlines attached to them. (11)*
- *I set goals in such a way that I will not experience failure. (12)*
- *I, myself, set my goals for my sport.*

Anxiety control

The nature of sport is to place stress upon those who take part, to make demands upon their physical and mental energies. Sport offers its participants an opportunity for growth, a chance to push back personal boundaries, and to liberate the body and mind simultaneously. There is nothing damaging about this stress, and it can be positive (Terry, 1989). However, athletes are often placed into critical and demanding competitive situations where differences in skill level and preparation between the best performers are often negligible. Situations such as these, where the outcome is both important and uncertain, have the potential to be extremely stressful and to elicit anxiety in many athletes (Jones & Swain, 1995).

A long-standing problem in the study of the arousal-performance relationship has been the inconsistent use of terms such as arousal, stress and anxiety. It is therefore important to clarify their specific meanings.

Arousal

Arousal can be viewed as having an energising function (physiological and psychological activation) that is responsible for the harnessing of the bodies resources, and lies on a continuum from deep sleep to intense excitement (Landers, 1980; Sage, 1984). Arousal is not automatically associated with either pleasant or unpleasant events (Weinberg & Gould, 1995).

However, according to Rushall, Batty and Gotts (1983) when the state of arousal are experienced as a unique set of symptoms for one athlete but as an entirely

different set of symptoms for another, then operationally the two states are different. They supported the concept of the multidimensionality of the arousal state, and that the complexity of that state is individual. Using the same label, in this case arousal, to infer a construct based on different sets of indicators that are peculiar to each athlete, can lead to confusion rather than understanding. In the applied setting, they consider the term pre-competition readiness more appropriate, because it does not remove the possibility that a construct is part of a mosaic of factors that interact in pre-competition readiness.

Anxiety

Anxiety can be considered the emotional impact or cognitive dimension of arousal, where unpleasant emotional reactions accompany arousal of the autonomic nervous system (Landers, 1980). Martens (1977) suggests that anxiety reactions would result from an objective environmental demand interpreted as threatening (a perceived imbalance between the demand and one's response capabilities) by an athlete. Anxiety has a thought component called cognitive anxiety, and a somatic component, which is the degree of physical activation perceived by the athlete. Anxiety can also be differentiated based on the stable personality components (trait anxiety) or changing mood states (state anxiety).

State anxiety refers to the ever changing mood component and is defined as a mood state characterised by subjective, consciously perceived feelings of apprehension and tension, accompanied by or associated with activation or arousal of the autonomic system. Cognitive state anxiety concerns the degree to which one worries or has negative thoughts, whereas somatic state anxiety concerns the moment-to-moment changes in perceived physiological activation that comes from stress.

Trait anxiety is an acquired behavioural tendency or disposition that influences behaviour, and is part of the personality. It is a motive or acquired behavioural

disposition that predisposes an athlete to perceive a wide range of objectively non dangerous (physically or psychologically) circumstances as threatening and to respond to these with state anxiety reactions disproportionate in intensity and magnitude of the objective danger (Weinberg & Gould, 1995).

Stress

The degree of stress experienced by an athlete is determined by how one interprets a particular situation. Emotional reactions to stress that exceed an athletes tolerance level are unpleasant. Stress can be considered from two standpoints. It can be viewed from an athletes reaction to stress and it can also be viewed with respect to the source of stress. Increasing the incentive and increasing the importance of the event for the athlete increases the stress. Typical bodily responses to stress include an increase in muscular tension, nausea, headaches, stomach cramps, rapid heart rate, shortness of breath, sweating, trembling hands, and shaking legs.

It is frequently assumed that the positive benefits of experience in the reduction of stress will be automatic. Repeated exposure to stress can enable an athlete to habituate to that stress, to become more familiar with it and thereby learn how to cope with it more effectively. However, should the athlete's tolerance level be greatly exceeded, then the experience will almost certainty be counterproductive and create emotional problems, negative attitudes, and loss of confidence (Davies, 1989).

Performance characteristics

With any athlete preparing for or performing in competition there are a number of factors that can affect the outcome and style of performance by increasing an athlete's anxiety levels. This includes having unrealistic beliefs about performance (thinking one will perform poorly), believing in "worry" and thinking that one is supposed to be nervous, having experienced a sub-standard performance during a previous competition, believing that one's self-worth as an

athlete is dependant upon athletic performances, the importance of the event, the size and supportiveness of the crowd, an emphasis on the athlete, the expectations of success, and the fear of physical injury (Harris & Harris, 1984; Terry, 1989).

Whenever any of these factors is experienced, athletes can become highly anxious, which can result in their performance being rigid, inflexible, stereotyped and easily predictable. Athletes can react slower in the normal competitive situation than they would in the relatively relaxed conditions of practice. During tense and crucial moments in a competition, the athlete can be characterised by indecision and making unforced errors. Distractions by stimuli that should be irrelevant can also occur (Davies, 1989).

Every athlete can minimise the frequency and the intensity of the anxiety experienced through learning mental and physical skills and strategies. Physically, athletes can be taught to relax their bodily tensions, and mentally they can learn to restructure thoughts and images that are counterproductive to good performance. They can increase their ability to concentrate, to use imagery and to communicate (Harris & Harris, 1984).

Relationships between arousal and athletic performance

A number of theories and hypotheses have been proposed to account for the relationship between arousal and athletic performance, such as the drive theory, inverted U-hypothesis, Hanin's optimal zone of arousal hypothesis, catastrophe theory, reversal theory, and multidimensional theory of anxiety (Gould & Krane, 1992).

1. Drive theory

The drive theory states that performance is a function of drive (physiological arousal) and habit strength (dominance of either the correct or incorrect response). It suggests that a positive linear relationship exists between arousal

and performance. Increasing arousal levels is beneficial with tasks that are well-learned or with skills that are simple (Spence, 1958). However, the drive theory does not appear to be sufficiently applicable to complex motor tasks and thus is considered too simplistic to explain complex athletic performance (Gould & Krane, 1992).

2. Inverted U-hypothesis

According to this theory the arousal-performance relationship follows an inverted u-curve with an optimal level of arousal for each individual task. As the complexity of the task increases the level of arousal required for optimal performance decreases. Levels of arousal below and above the optimal point are associated with inferior performance (Yerkes & Dodson, 1908). The optimal level of arousal varies according to the nature of the task, ability of the athlete and personality dimensions. High levels of arousal are advantageous for gross motor skills, while similar arousal levels will interfere with complex motor skills. Beginners usually perform poorly under increased pressure and arousal levels, while the elite athlete may perform well under pressure. Some athletes experience situations as more threatening than other athletes (Oxendine, 1970). The inverted U- hypothesis has received much criticism (Gould & Krane, 1992). One can argue that the relationship between arousal and performance is much more complex than suggested by the hypothesis (Neiss, 1988).

3. Hanin's zones of optimal functioning

According to Hanin's zone of optimal function hypothesis (ZOF) the large variability in state anxiety scores typically found in field studies with different athletic subsamples makes it unlikely that one specific optimal level of state anxiety exists that leads to best performance. Through retrospective and systematic multiple observations of athletes' state anxiety and performance levels, a zone of optimal function can be identified. Athletes whose state anxiety fell within their ZOF would be expected to perform better than athletes whose state anxiety was outside of their ZOF. Although it is conceptually limited to hypothesis status, there are several aspects that make it attractive. First, it is

intuitively appealing and appears to be very realistic. Second, it has the strength of precisely predicting at what state anxiety levels optimal athletic performance will result (Gould & Krane, 1992). Athletes need to know their own optimal levels of arousal for peak efficiency (May, 1985).

Prapavessis and Grove (1991) tested the utility of Hanin's (1980) zone of optimal function model on a sample of 12 high-performance adult clay-target shooters. Results supported the hypothesis that precompetitive mood states are related to shooting performance, because mood state difference scores across optimal and acceptable performances consistently yielded smaller values than differences across worst and optimal performances.

4. Catastrophe theory

The catastrophe theory is similar to the inverted U-hypothesis in that both predict that increases in state anxiety will facilitate performance up to an optimal level. In contrast to the inverted U-hypothesis, the catastrophe theory proposes that when an athlete goes "over the top," there will be a large and dramatic decline in performance. The catastrophe model assumes that there are two subcomponents to anxiety: physiological arousal and cognitive anxiety. Physiological arousal is characterised by a sympathetic physiological arousal response and may be reflected at least partially by somatic anxiety. Cognitive anxiety mediates the effects of physiological arousal and can directly influence performance. Thus the relationship between physiological arousal and performance will differ depending on one's level of cognitive anxiety with catastrophic performance effects occurring only when cognitive anxiety is high (Gould & Krane, 1992).

5. Reversal theory

The reversal theory assumes that arousal and affect are dependant upon the athletes arousal level. High arousal may be interpreted as excitement (pleasant) or anxiety (unpleasant) and low arousal may be interpreted as relaxation (pleasant) or boredom (unpleasant). The interpretation of affect as pleasant or

unpleasant is also known as the hedonic state. Due to the fact that both arousal and affect vary on a continuum, the reversal theory predicts that two curves depict the relationship between arousal and affective pleasures. Each curve represents a different metamotivational state or mode. A metamotivational state has been defined as a phenomenological state characterised by a certain way of interpreting some aspects of one's motivation. Metamotivational states go in pairs of opposites; only one member of each pair being active at a given time. The telic mode is characterised by its seriousness or orientation toward a goal, whereas the paratelic mode is characterised by playfulness or an activity orientation. The telic mode can also be thought of as arousal seeking, and the paratelic as arousal avoiding. A basic contention from reversal theory is that arousal is not necessarily pleasant or unpleasant. Rather, depending on one's metamotivational state it can be perceived as a positive (paratelic) or negative (telic) state (Gould & Krane, 1992).

6. Multidimensional anxiety theory

The multidimensional anxiety theory sees anxiety as being composed of two distinct components, cognitive and somatic anxiety. Cognitive anxiety refers to feelings of worry or apprehension while somatic anxiety reflects heightened physiological activation (Bird & Horn, 1990). It is necessary to differentiate between the two because they both have differing antecedent conditions and hence are hypothesised to affect performance differentially (Gould, Petlichkoff, Simons & Vevera, 1987; Gould, Petlichkoff & Weinberg, 1984).

Cognitive anxiety is more consistently and strongly related to performance, and impairs performance more than does somatic anxiety (Jones, Swain & Cale, 1990; Morris, Davis & Hutchings, 1981). Athletes with high cognitive anxiety suffer performance impairments because their attention is misdirected from task-relevant to task-irrelevant, self or evaluative cues (Gould et al., 1987). Cognitive anxiety should be a more powerful mediator of ongoing performance because expectations of success may change at any time during competition (Morris et al., 1981). Elevations in cognitive anxiety are directly related, in a

linear fashion, to mental errors that occur during sport performance (Bird & Horn, 1990). Mental errors were defined as the degree to which each athlete's performance was adversely affected during a particular game as compared with their usual performance during practice. Cognitive anxiety tends to remain constant during the precompetition period (Swain & Jones, 1992).

Somatic anxiety, which shows a curvilinear relationship with performance, should primarily affect initial performance when competitors are still feeling nervous or "tight," and exert only minimal impact on ongoing performance (Burton, 1988; Morris et al., 1981). This is because it is noncognitive in nature and does not typically preoccupy an athlete's thoughts. It only influences performance when the athletes' become preoccupied with the internal functions of their body (Gould et al., 1984). Somatic anxiety tends to increase rapidly near the start of the event (Swain & Jones, 1992).

However, the study by Gould et al. (1987) on pistol shooting suggested that somatic anxiety influenced performance the most because the task requires fine neuromuscular control and is particularly sensitive to responses in the body. These varying results support the findings that anxiety must be viewed as a multidimensional construct, and that tasks varying in specific neuromuscular and perceptual attentional characteristics will influence the effect various anxiety components have on performance. Multidimensional anxiety theory, however, predicts that, based on somatic anxiety's basic pattern of change, it should influence competition of short duration more than ongoing performances of longer duration (Burton, 1988).

Multidimensional anxiety theory sees task complexity as being composed of three primary factors, namely, decision characteristics, perceptual characteristics, and response characteristics.

The greater the overall task complexity, the lower the arousal level that is optimal for best performance (Landers & Boutcher, 1986). However, Krane and

Williams (1994) suggest that individual differences may be more salient than task characteristics in determining optimal arousal levels. Although the lay person may detect apparently obvious complexity differences in various sport skills a highly trained athlete or coach will perceive many intricacies, and perceive much greater complexity within a specific skill.

The conceptualisation of anxiety as a multidimensional construct has led to the development of measures such as the *Competitive State Anxiety Inventory-2 (CSAI-2)*, which also measures self-confidence (Martens et al., 1990).

Krane and Williams (1994) examined the cognitive anxiety, somatic anxiety, and self-confidence in male and female high school and college track and field athletes. The athletes completed the *CSAI-2* within 20 minutes of each event in which they competed at a prestigious invitational track and field relay meet. The more experienced college athletes displayed lower cognitive and somatic anxiety than less experienced high school athlete's. Hurdlers displayed greater cognitive anxiety than runners in the open events (400m or less). The greater complexity of the hurdle events and resulting potential for something to go wrong may have caused the hurdlers to have more mixed concerns about performance than open event runners. The greater risk of injury when running the hurdles compared to running an open event may have inflated cognitive anxiety. No differences in anxiety between athletes competing in sprint, middle distance and distance events were observed.

The identification of antecedents of cognitive anxiety and self-confidence can be helpful in the search for effective methods of achieving optimal performance states. Jones, Swain and Cale (1990) examined the situational antecedents of competitive state anxiety and self-confidence in elite intercollegiate middle-distance runners. A *Pre-Race Questionnaire* was developed to facilitate such an examination. It was structured with the intention of measuring situational variables that contribute to middle-distance runners' feelings and perceptions during the period immediately preceding a race. Five factors emerged as a result

of the factor analysis of the *Pre-Race Questionnaire*. These related to the athletes' perception of their readiness, attitude toward previous performances, perceptions of the difficulty of the position goal they had set and whether they could achieve it, the influence of the coach on recent training and performance, and the suitability of the weather and track conditions.

The factor that best predicted cognitive anxiety was perceived readiness, which incorporated items concerning perceptions of mental and physical readiness, level of fatigue, and effectiveness of recent training. Attitudes towards previous performance also proved to be a significant predictor of cognitive anxiety, containing items that probed the athlete's reactions to previous race and races during the previous four weeks. The third predictor of cognitive anxiety was position goal. It was positively related to the athlete's perception of whether he could achieve the goal. The results showed that none of the five factors significantly predicted somatic anxiety.

Perceived readiness was the most significant predictor of self-confidence. However, the other predictor of cognitive anxiety, attitude toward previous performance, failed to significantly predict somatic anxiety. A factor not significantly related to cognitive anxiety, external environment was a further significant predictor of self-confidence (Jones et al., 1990). Gould et al. (1984) found that somatic anxiety increased during the time leading to competition, while cognitive anxiety and confidence remained constant.

Findings suggest that cognitive anxiety and self-confidence share some common antecedents that contribute to performance expectations but there are also factors unique to each. Self-confidence comprises the positively worded items that were presumed to form part of the cognitive anxiety scale (Martens et al., 1990).

However, the *CSAI-2* measures only the intensity (amount or level) of anxiety. In order to gain a greater understanding of competitive state anxiety other than the

intensity of the response it is suggested that the anxiety dimension of frequency (how often athletes are experiencing their symptoms) be incorporated (Swain & Jones, 1993).

Swain and Jones (1993) examined a sample of male and female track and field athletes who were administered a modified *CSAI-2* at four time periods in the lead up to an important event in order to determine the intensity and frequency of competitive state anxiety. Results indicated that the frequency of cognitive and somatic anxiety symptoms increased in all subjects as the event approached. The intensity of cognitive anxiety remained relatively stable, while the intensity of somatic anxiety showed a similar pre-competition patterning as the frequency of somatic anxiety.

The *CSAI-2* also fails to measure directional perceptions of the symptoms, nature of the athlete's interpretation of those symptoms in terms of whether they are positive or negative in relation to upcoming performance (Jones & Swain, 1995).

Cognitive anxiety is not necessarily debilitating to athletes (Jones & Hanton, 1996; Jones & Swain, 1992, 1995). The high competitive group as measured by the *Sport Orientation Questionnaire (SOQ)* (Jones & Swain, 1992), elite cricket players (Jones & Swain, 1995), and swimmers (Jones & Hanton, 1996) all interpreted their anxiety levels as facilitating their performance. Elite athletes appear to have predispositions to interpret anxiety levels differently, and typically have more positive interpretations of these symptoms in terms of their consequences for performance (Jones & Swain, 1995). However, in the study by Jones and Hanton (1996) on swimmers this could probably be due to the relatively high skill level of the swimmers who participated in the study.

Swain and Jones (1992) examined the notion that the predicted temporal patterning of the *CSAI -2* subcomponents may be mediated by the individual difference variables of achievement motivation, a personality dimension. Results clearly showed that the competitiveness dimension of the *SOQ* formed the

strongest relationship with the *CSAI-2* subcomponents. The high competitiveness group reported less anxiety than the low competitive group. The reason for this could be that they regard competition as more challenging and stimulating than do athletes of a lesser competitive disposition. The low competitive group tended to report a progressive increase in cognitive anxiety, whereas in the high competitive group cognitive anxiety remained stable. In the case of somatic anxiety, differential patterning emerged with the low competitive group reporting an earlier elevation than did the high competitive group. This appears to lend support to the argument that low competitive athletes may not perceive competition to be as stimulating as their higher competitive counterparts.

Anxiety control summary

Discrepancy exists as to an umbrella term for the psychological skill that covers arousal/anxiety/stress/pre-competition readiness. The term anxiety control is deemed the most appropriate for this research study because it covers the cognitive dimensions of perceiving a situation as threatening or not. Determining the cognitive aspect is more important and reliable in differentiating successful from less successful athletes, than using arousal symptoms such as sweating, nausea, and nervousness.

Questionnaires such as the *Sport Competition Anxiety Test* and the *CSAI-2* measure only the intensity (amount or level) of anxiety. They fail to measure the frequency of the symptoms, and how athletes perceive their anxiety as being facilitating or debilitating to their performance. It was not deemed appropriate to include any items relating to the somatic anxiety experiences of athletes because it does not influence performance to such a large degree. An important characteristic of successful athletes is that they respond positively to frustrating situations. The following items are all characteristics of the more successful athlete.

- *I perform better in important competitions than in practice sessions.*
- *I am more tense before than during important competitions.*
- *My nervousness helps me to perform better during important competitions.*
- *The more important the competition the more enjoyable it is for me.*
- *I enjoy the challenges of important competitions.*

Cognitive anxiety is more consistently and strongly related to performance. It results in performance impairment because attention is misdirected from task-relevant to task-irrelevant, self or evaluative cues. Mental errors were seen as increasing when cognitive anxiety increases. The following items reflect the level of cognitive anxiety experienced by the athlete.

- *Before I compete in important competitions I get tense.*
- *Before I compete in important competitions I worry about not performing well.*
- *I worry about making mistakes in important competitions.*
- *I worry about failing in important competitions.*
- *I am concerned that others will be disappointed with my performance in important competitions.*
- *When I make a mistake during important competitions I become nervous.*

Successful athletes are better able to recognise and control their anxiety, as are indicated in the following items.

- *I can control my nervousness before important competitions.*
- *I can handle the unexpected stress during important competitions.*
- *I know how to make myself relax in difficult situations.*
- *When I become tense during important competitions I can recognise the signs of nervousness in myself.*

Maintaining confidence

Sport psychologists define confidence as the belief that one can successfully perform a desired behaviour. Optimal confidence means being so convinced that one can achieve one's goals that you will strive hard to do so. It does not mean you will always perform well, but it is essential to reaching one's potential. An athlete can expect to make some errors and bad decisions, and might lose concentration occasionally, but a strong belief will help the athlete deal with errors and mistakes effectively and keep striving towards success (Terry, 1989).

Approaches to confidence

Sport psychologists have adopted four approaches to studying confidence in sport.

1. Self-efficacy theory

It has been argued that if athletes expect to perform well and are confident in their ability then actual performance will be enhanced. In Bandura's (1977) theory he views behavioural change as being mediated by a common cognitive mechanism, self-efficacy, which is defined as the strength of conviction that one can successfully execute a behaviour required to produce a certain outcome. Efficacy expectations determine how much effort people will expend and how long they will persist in the face of obstacles and aversive experience. Self-efficacy is related to goal setting with those exhibiting high self-efficacy being more likely to set challenging goals. Although self-efficacy is task specific, it can generalise to other similar skills. Bandura's theory does not discount the importance of skill level and/or motivation. Expectations alone will not produce the desired performance if the component capabilities are lacking. However, if an athlete is capable of a response and there are appropriate incentives for performance, then it asserts that actual performance will be predicted by the athlete's belief in personal competence.

Self-efficacy is enhanced by successful performance, vicarious experience, verbal persuasion, and emotional arousal. According to Bandura, successful performance raises expectations for future successes; failure lowers these expectations. Once strong feelings of self-efficacy develop through repeated success, occasional failures will be of small consequence. Feelings of self-efficacy lead to improved performance, while an opposite occurs with a lack of these feelings (Bandura, 1977).

The most critical aspect of Bandura's theory is repeated success through participatory modelling. The subject first observes a model perform a task. The model then assists the subject in successfully performing a task. The subject is not allowed to fail. As a result of repeated success, strong feelings of self-efficacy develop. This assumption is supported by McAuley (1985), with subjects in the modelling groups expressing stronger efficacy expectations and lower levels of anxiety, and performing better on a gymnastic task than the control group.

Bandura does not view self-efficacy as a global personality trait but rather as a situationally specific variable. This is in contrast to self-confidence that is often used as a trait measure in the personality literature. Self-efficacy expectations may change depending on the situation, the task and the previous experience of the athlete. Bandura and Jourden (1991) found that with increasing experience prior performance makes a weaker contribution, and perceived self-efficacy accounts for a large share of the variance in performance attainment. Experience with a task may mediate the impact of a superior or poor performance on efficacy beliefs. Experienced athletes may understand that performances will fluctuate to some extent, and thus, may not weigh a particular performance too heavily in terms of efficacy expectations. Novices must rely on only a few mastery experiences for efficacy information. Therefore, fluctuations in performance may lead to greater modification of self-efficacy beliefs (George, 1994).

In the study by George (1994) on a nine-game period during the baseball season, moderate support was found for Bandura's model. Higher performance predicted

stronger precepts of efficacy in six games, and lower levels of somatic and cognitive anxiety were associated with stronger self-efficacy beliefs in seven games. Stronger self-efficacy predicted greater effort in six games and higher performance in five games.

Self-efficacy performance relationships may be affected by variables outside the model or by methodological limitations. Self-efficacy will not predict performance if factors beyond one's control are partially responsible for successful performance. If each athlete only completes one measure of self-efficacy per competition, it is possible that efficacy expectations could change during the competition. The time lapse between the administration of the efficacy questionnaire and actual performance can influence the strength of the self-efficacy relationship. If self-efficacy and performance are not measured closely in time, efficacy beliefs may be influenced by new experiences during the intervening period (George, 1994).

It has been suggested by George (1994) that future research needs to examine how various psychological skills such as imagery, self-talk, and goal setting are related to efficacy expectations.

2. Perceived competence

Harter (1978) proposed a theory of achievement that is based on an athlete's feeling of personal competence. According to Harter, individuals are innately motivated to be competent in all areas of human achievement. To satisfy the urge to be competent in an achievement area such as sport, the athlete attempts mastery. An athlete's self-perception of success at these mastery attempts, develop feelings of positive or negative effect. Successful attempt at mastery promotes self-efficacy and feelings of personal competence, which in turn fosters high competence motivation. As competence motivation increases, the athlete is encouraged to make further mastery attempts. If an athlete's attempts at mastery result in perceived rejection and failure, then low competence will be the end product

3. Performance expectancies

The antecedent factor that is most influential in the development of performance expectancies is the success-failure history of the athlete on the same task or related tasks. Athletes who characteristically experience success at an activity develop perceptions of high ability and, because ability is a relatively stable and invariant attribute, they expect to perform capably on similar tasks in the future. Athletes who typically experience failure perceive their ability to be low. The stable nature of the ability attribute results in low performance expectations consistent with the perceived lack of capability (Scanlan & Passer, 1981).

Scanlan and Passer (1981) sought to determine specific intrapersonal and situational factors influencing the personal and team performance expectancies of young male athletes just prior to engaging in a competitive soccer game, and examined the effects of winning or losing the game on athletes' postgame performance expectations involving a future hypothetical rematch with the identical team. The pre-game findings revealed that the interpersonal factors of ability and self-esteem were related to personal performance expectations while competitive trait anxiety was not, and the situational factors of past win-loss record and a prior game win or loss against the same opponent influenced team performance expectancies. The postgame findings revealed that future expectancies were affected by the interactive effects of game win-loss and self-esteem. Similar results were also obtained with young female soccer players (Scanlan & Passer, 1979).

Athletes with lower prematch performance expectancies and more frequent worries about failure experience higher prematch stress and are more likely to suffer defeat than their counterparts (Scanlan, Lewthwaite & Jackson, 1984). Feltz and Brown (1984) found a weak relationship between years of playing experience and both perceived soccer competence and physical competence.

4. Sport-confidence

Significant developments in the area of self-efficacy, perceived competence, and performance expectancies, resulted in a theoretical model of sport-confidence by Vealey (1986). This was an attempt to allow more consistent predictions of behaviours across different sport situations. The model of sport-confidence was based on the interactional paradigm, sport-specificity, the distinction between personality traits and states, and the reciprocity of individual differences and behaviour.

Sport-confidence was defined as the belief or degree of certainty athletes possess about their ability to be successful in sport. Attempting to predict behaviour by measuring sport-confidence requires measuring the goal upon which sport-confidence is based. The term "competitive orientation" was established to indicate a tendency for athletes to strive toward achieving a certain type of goal in sport. Sport-confidence is grounded in perceptions of ability, thus the competitive orientation should reflect an athlete's belief that attainment of a certain type of goal demonstrates competence and success. Performing well and winning are selected as the goals upon which competitive orientations are based. Through successive sport experiences, athletes become performance-orientated or outcome-oriented (Vealey, 1986).

Sport-confidence may be separated into two constructs: a dispositional construct termed trait sport-confidence (SC-trait) and as state sport-confidence (SC-state). SC-trait may be defined as the belief or degree of certainty athletes usually possess about their ability to be successful in sport. Sport-confidence may also be conceptualised as a state by changing the time reference. SC-state is defined as the belief or degree of certainty athletes possess at one particular moment about their ability to be successful in sport. The individual difference constructs of SC-trait and competitive orientation interact with the objective sport situation to produce SC-state. Individual differences in SC-trait and competitive orientation are predicted to influence how athletes perceive factors within an objective sport situation with certain levels of sport-confidence. SC-

state is predicted to be the most important mediator of behaviour and is based on the mutual influence of situational factors and individual differences (Vealey, 1986).

Benefits of confidence

Confidence can help athletes in the following areas.

1. Confidence affects goals

Poag and McAuley (1992) found that more efficacious athletes perceived themselves to have been more successful in achieving their goals at the end of an exercise programme, and had the confidence to attain self-set goals. Weinberg et al. (1993) found that athletes higher in perceived ability felt that goal setting was more effective for them in a number of areas than did lower perceived ability athletes.

2. Confidence arouses positive emotions

Moritz, Hall, Martin and Vadocz (1996) found that sport-confident athletes were more likely to image incidents of mastery, for example, coping successfully with stressful situations, and arousal during competition. Imaging only skills that comprise a motor task will have little impact on an athlete's sport-confidence.

The study by Treasure et al. (1996) examined the relationship between self-efficacy, wrestling performance, and affect prior to competition. Self-efficacy was found to be positively associated with pleasant precompetition emotions and negatively associated with unpleasant precompetition emotions.

3. Confidence increases effort and persistence

Bandura and Cervone (1983) tested the hypothesis that self-evaluative and self-efficacy mechanisms mediate the effects of goal systems on performance motivation. These self-reactive influences are activated through cognitive comparison requiring both personal standards and knowledge of performance. When both comparative factors were present, the evaluative and efficacy self-

reactive influences predicted the magnitude of motivation enhancement. The higher the self-dissatisfaction with a sub-standard performance and the stronger the perceived self-efficacy for goal attainment, the greater was the subsequent intensification of effort.

Kane, Marks, Zaccaro and Blair (1996) examined wrestlers' self-regulation during a week of performance at a wrestling camp. Self-regulation describes changes in behaviour and cognition that occur as athletes try to reach their performance goals. Overtime competition was used to test the assertion that self-efficacy should be the primary contributor to achievement. This occurred when a matc was tied after regulation time and both wrestlers demonstrated close to equal ability in that match. Self-efficacy contributed significant variance to overtime performance. The findings from Weinberg (1985) and Weinberg, Gould and Jackson (1979) showed that high self-efficacy subjects held out their legs significantly longer than low self-efficacy subjects in a muscular endurance leg test. Both these studies supported Bandura's (1977) contention that strong self-efficacy beliefs influence performance by raising individual effort in challenging situations.

Rudolph and McAuley (1996) found that athletes who possessed high pre- and postexercise efficacy reported lower perceptions of effort and physical strain during exercise compared to less efficacious participants.

4. Confidence facilitates concentration

When feeling confident, the mind is free to focus on the task at hand. When confidence is lacking, athletes will tend to worry about how they are doing or how well others think they are doing. A preoccupation with avoiding failure will impair concentration by making you more easily distracted (Weinberg & Gould, 1995).

5. Confidence affects perception of stress

Athletes with higher self-efficacy perceive the competitive situation to be less threatening than athletes with low levels of efficacy (Treasure et al., 1996).

6. Confidence affects performance

Martin and Gill (1991) found that highly confident high school distance runners ran faster and placed higher than less confident athletes. Treasure et al. (1996) found that wrestlers higher in precompetition self-efficacy performed better than those with lower precompetition self-efficacy.

The ability to do justice to one's ability, to be confident, to be physically relaxed yet mentally alert in highly stressful conditions is a skill that can be acquired through appropriate practice and experience (Davies, 1989).

Most athletes can be placed on some kind of continuum regarding confidence. This continuum extends at one end to include athletes who have hardly any confidence in themselves, to the majority of athletes who are more or less confident, and at the other end a relatively small group of athletes who are extremely confident. But an athlete's position is likely to be frequently changing on this continuum as a result of the competitive experiences (Davies, 1989).

The confidence of athletes is strongly influenced by the coach and other people closely connected with their training. The coach's expectations of an athlete's potential ability can be a very powerful factor concerning performance in a competition. The tendency will be for the athlete to perform well if the expectations from the coach are high and optimistic. Where the expectations are low and pessimistic, the tendency will be to do badly (Davies, 1989).

Lack of confidence is frequently accompanied by over-anxiety and high activation. Both these states result in poor performance. However, confidence can be generated. Well-planned preparation will enable athletes to do justice to their ability and to perform consistently at their peak. There are a number of

strategies that can be employed to enhance confidence, such as relaxation, preparation, mental rehearsal, competitive programmes, and modelling (Davies, 1989).

Athletes should learn to relax so that relaxation becomes the dominant response in stressful competitive situations. Thorough preparation is essential. In sport this means extensive practice in acquiring the skill of the activity. Athletes must prepare themselves physically, mentally, and emotionally. Preparation means the athlete has thoroughly experienced in practice the conditions that will operate in the competitive situation. Mental rehearsal is another technique that can be used to increase confidence. Competitive programmes should be arranged which will bring much success, because successful experiences lead to an increase in the level of aspiration or expectancy of future success. Short-term, progressive, attainable goals can be set which result in a series of repetitive successes. It is also important to remember the experiences of successful past performances because this helps to build self-confidence. Athletes should practise experiencing these feelings which went with their successes. Confidence can be developed when athletes are given the opportunity of modelling their behaviour on competent, confident athletes (Davies, 1989).

Confidence summary

Four approaches to confidence in sport, namely, self-efficacy, perceived competence, performance expectancies, and sport-confidence have been discussed.

According to Vealey (1989) constructs such as Bandura's (1977) self-efficacy could account for more of the variance in athletic performance than other factors currently being used. Self-efficacy is the strength of conviction that one can successfully execute a behaviour required to produce a certain outcome. Bandura (1986) recommends that in determining self-efficacy it is necessary to determine athletes' general capabilities rather than one singular aspect, such as,

"How confident are you in your ability in sport?" However, this creates problems with an inventory with the primary purpose of covering a wide spectrum of sporting experiences.

Aspects of Bandura's (1977) self-efficacy theory that could prove significant include the following:

- with increasing experience prior performance becomes less important, and self-efficacy accounts for a larger share of the variance in performance attainment
- self-efficacy is a situation-specific variable that is influenced by the situation, the task, and the previous experience of the individual, which makes it necessary to determine the self-efficacy of an athlete more than once a season
- athletes with higher self-efficacy perceive the competitive situation as less threatening than athletes with lower levels of self-efficacy.

The following items are applicable from the self-efficacy theory.

- *My previous performances have an effect on my subsequent performances.*
- *I feel threatened by important competitions..*

Lack of confidence can result in poor performance. However, this can be overcome by employing a number of coping strategies, which can be taught to athletes. The strategies include relaxation, preparation, mental rehearsal, competitive programmes, modelling, and self-talk. The following items enable general situations to be identified where the athlete lacks confidence, and where athletes are able to rectify it through initiating some form of coping strategy.

- *If I lose confidence during a competition I know how to recover it.*

- *Before important competitions I am confident that I can handle the pressure.*
- *I experience thoughts of failure during important competitions.*
- *Before important competitions I am confident that I can meet the challenges.*
- *My confidence tends to drop as an important competition draws nearer.*
- *When I begin to perform poorly, my confidence drops quickly.*
- *Before an important competition I am concerned that I may not do as well as I could.*
- *I am concerned about losing during important competitions.*
- *Before important competitions I am confident that I will perform well.*

When an athlete is thoroughly prepared confidence will be at its peak. Thorough preparation includes being physically, mentally, and emotionally ready for what lies ahead. If athletes experience doubt in their ability this means that they are not fully prepared. This is reflected in the following items.

- *I have doubts about the ability I have in my sport.*
- *I practise the conditions which I am likely to experience in the competitive situations.*

Concentration

Concentration or selective attention involves being able to attend to what is going on, the degree to which one can attend, and how long one can continue to attend to what is going on around oneself. Selective attention is being able to choose to attend to specific things going on and to ignore others, or the ability to put the mind on one thing at a time or on all things that relate to what is going on at a time. The more one has the ability to attend to what one wants to, the better the response and the performance (Harris & Harris, 1984).

Attention is the term used in psychology to describe the process that is used to perceive the outside world. Attention has several dimensions. One aspect is how diffused or how concentrated attention is. Attention can be spread over many stimuli or it can be concentrated on one particular point. Another aspect concerns the degree of alertness. An athlete may be very alert and respond quickly and easily to the situation. In the same situation, another athlete may be inattentive to available stimuli and slow to respond even when the coach and the spectators are providing advice and direction. A good athlete has to learn to be fully aware of what is going on and pay attention to and respond to relevant cues on time without being distracted. The cues selected for attention provide yet another aspect of the attentional process. The athlete should isolate certain cues for more extensive processing while others are treated more perfunctorily (Harris & Harris, 1984). While the athlete's attention is selective, what is being selected may change rapidly from one moment to the next. As the attentional focus increases on what is going on around the athletes in sport, the attention directed to the self will diminish. However, if the focus of attention stays on the self, that is on how worried and anxious you are about performing, then the attention directed to what is going on around you will diminish. Athletes need to learn how to shift attention from the self to the sports environment as the situation may demand (Harris, 1985). A classic example of the inability to shift from self back to the environment is when you make a mistake and continue to berate yourself well beyond the time of the mistake. Another factor in sports environment that is conducive to the shifting of attention from the environment to the self is the presence of spectators (Harris & Harris, 1984).

Peak performance occurs when one voluntarily concentrates on the cues in the environment and perceives them to demand an action that is within one's ability to execute. The challenge of the situation must match your perceived ability to maintain the concentration throughout the execution. If there is an imbalance between the challenges and the skills, attention will waver (Harris & Harris, 1984).

Maximal sport performance occurs when intense concentration of attention is focused on a limited stimulus field where only relevant cues are processed from the multitude available. Certain positions in specific sports or specific tasks in some sports require one type of attentional focus while other positions demand a different type. Most team sports require the ability to shift back and forth from a broad to narrow focus of attention whereas most closed skills demand a narrow focus throughout the context (Harris, 1985). Maximal performance is based on acquiring the skills and disciplines to execute the behaviours that are demanded within the situation (Harris & Harris, 1984).

Focusing on the components of a well-learned behaviour disrupts performance. At the same time, focusing on the elements of a poorly learned activity or one that is just being learned is facilitating or even essential to performance. Focusing on the components of the performance slows the behaviour down in such a manner that smoothness, the co-ordination of the whole or the flow of the act is disrupted. However, it can be facilitating to the overall organisation of the act. Focus on the elements or component parts of a skill is facilitating, produces a more careful selection of appropriate component acts and a more thorough monitoring of the execution of them that would otherwise occur. This approach allows for adjusting and smoothing as it develops and organises the sequence of acts to a co-ordinated whole. Consciously attending to the sequence of acts leads to a gradual assumption of automaticity in the execution (Harris & Harris, 1984).

In the study by Thomas and Over (1994) on the psychological and psychomotor skills associated with performance in golf, the more skilled golfers had a higher level of automaticity. The data emphasised the importance of automaticity in skilled performance at golf. The lower handicapped golfers reported a well-grooved swing in which actions seem automatic rather than consciously controlled. Higher handicap golfers claimed that they continually make adjustments to their alignment, position, grip, or swing. They were more prone to errors of judgement in their shot making and generally reported a lower level

of psychomotor control. Automaticity was associated with mental preparation and concentration, and the lack of negative thoughts and feelings.

Factors affecting concentration

Mental errors are generally caused by lack of concentration that can result from anxiety, worry, or laziness. This occurs especially during athletic contests, as opposed to practise. The most commonly accepted explanation for these errors is the increase in anxiety that occurs as a result of the highly evaluative nature of the competitive situation as compared to the practice conditions. Bird and Horn (1990) tested the relationship between the level of cognitive anxiety and degree of mental errors in a sport setting. The results indicated that elevations in cognitive anxiety, are directly related, in a linear fashion, to mental errors that occur during sports performance.

The findings from the study by White and Zellner (1996) indicate those athletes higher in ego orientation than task orientation are more likely to experience concentration disruptions prior to or during performance.

Concentration is negatively affected by aroused, angry behaviour, and by a social environment setting of considerable complexity and stress. Athletes exhibiting hostile aggression recorded lower concentration scores. Hostile aggression is defined as behaviour in which there is an intent to inflict harm or injury to another (Silva III, 1979).

Concentration summary

Concentration in sport is a vital aspect in determining sport performance. The better the athlete is able to attend to what is going on in a situation, the more success will result. A number of factors affect concentration, including mental errors, athletes high in ego orientation, and aroused, angry behaviour.

The following items cover a wide range of problematic situations where the athlete's concentration can be affected. This will help in identifying those aspects hindering athletes' performances.

- *I use fixed routines or rituals before competitions.*
- *During a competition I continue to concentrate well even after making a mistake.*
- *I have trouble concentrating during important competitions.*
- *When unexpected things happen during important competitions it disrupts my concentration.*
- *My concentration lets me down during important competitions.*
- *My thoughts interfere with my performance during important competitions.*
- *I can effectively block out negative thoughts during important competitions.*
- *Negative remarks by other people (e.g. spectators, opponents) upset me during important competitions.*
- *I can quickly refocus my concentration after becoming distracted during important competitions.*
- *When a competition is not going well my concentration is easily distracted.*
- *I think positive thoughts just before important competitions.*
- *When I compete I concentrate my attention on what I am doing at that specific moment rather than on what lies ahead.*
- *When I make a mistake, I have difficulty forgetting it and concentrating on my performance.*
- *I deliberately practise concentrating during practice sessions.*

Mental rehearsal

Imagery can be defined as a process by which sensory experiences are stored in the memory and internally recalled and performed without external stimuli

(Murphy, 1994). When attempting to produce a visual image, the more specific one can make that image, the more vivid the image will be. If possible, it is best to use as many of the five senses as possible. Visual imagery is the first step before mental rehearsal, and being able to specifically visualise the situation totally is very important. Mental rehearsal involves practising as a visual image an athletic technique, procedure, or event in one's mind. Initially this can be done step by step. As the athlete becomes proficient in this skill, one can slow down or speed up the rehearsal, until total synchronisation is achieved with the flow of the body (May, 1985).

Due to the fact that the media attention surrounding sport psychology is often associated with elite athletes, many falsely assume that mental skills such as imagery are only for top ranked amateurs or professional competitors. It is important to remember that imagery is like any other skill in that it requires systematic practice to develop and refine. Many athletes report that they employ imagery but have only a limited understanding of when, where, and how imagery is incorporated into their training and performances We all have the ability to generate and employ imagery, but often we choose not to use it, even in situations in which it could be beneficial (Hall et al., 1990). In the study by Gould et al. (1992a) on Olympic wrestlers, medalists relied on consistent mental preparation routines, whereas nonmedalists referred to mental preparation routines in conjunction with particular situations.

Imagery perspectives

There are two types of imagery perspectives: internal imagery and external imagery. Internal imagery requires an approximation of the real life phenomenology so that athletes actually imagine being inside their bodies and experiencing those sensations that might be expected in the actual situation. In external imagery, athletes view themselves from the perspective of an external observer (Mahoney & Avener, 1977).

The influence of imagery perspective may be more powerful in athletic performance than in other areas because of the importance of kinaesthetic awareness to sports performance. Sensory feedback from the body's movement is termed kinaesthesia, and seems to be experienced more through internal images than through external images (Schmidt, 1991).

According to Lang (1979) an emotional image contains two fundamental classes of statements: stimulus propositions and response propositions. Stimulus and response propositions bear similarity to Mahoney and Avener's (1977) distinction of external and internal perspective. Stimulus proposition describes the content of a scenario to be imagined, for example the physical details of an object or situation, object movement, physical place or general location, and presence or absence or observers. Response propositions contain assertions about behaviours, such as verbal responses (cries), somatomotor events (muscle tension), and visceral events (heart rate). They are expected to be accompanied by an efferent outflow appropriate to the image. Images that contain response propositions are likely to produce more vivid images and elicit more physiological responses than images that contain only stimulus propositions (Lang, Kozak, Miller, Levin & McLean, 1980).

Bakker, Boschker and Chung (1996) investigated the emotional imagery of Lang's (1979) model. Lang's model was applied to movement images of lifting of four and a half and 9 kilogram weights. During the imagery lifting of the weights, the electromyographical (EMG) activity of both biceps brachii muscles was assessed. When response propositions were emphasised in the script, imaginary weight lifting resulted in greater muscle activity than when stimulus propositions were emphasised. During imagined lifting, electromyographic activity of the active arm was greater than that of the passive arm. In the active arm, a significant difference in EMG activity was found between the 9 kilogram and four and a half kilogram.

Imagery ability

Good imagery ability has been defined by two primary characteristics: vividness and controllability of the imagery. Vividness relates to the athlete's self-report of clarity and reality in the image. Controllability is an athlete's ability to influence the content of the image. When an individual cannot imagine a script as it is described, the imagery is called uncontrolled (Murphy, 1994). This is very important because Powell (1973) found that mental practice is influenced by what the athlete imagines during mental practice. Positive mental practice was a more effective learning procedure than negative mental practice. Thoughts, images, and mental patterns act as the control mechanism that directs the body. Negative thought is particularly effective for destroying skilled performance. It is difficult for a body to accomplish something when the mechanism directing it (the head) says "can not," "will not'" or "not able".

Uses of imagery

Athletes can employ imagery in many ways to improve both physical and psychological skills.

1. Building confidence

Moritz et al. (1996) examined the relationship between confidence and imagery in 57 elite roller skaters. The results showed that imaging the successful performance of specific motor skills may increase confidence. This indicates that the imaged rehearsal of specific sport skills may not be as important as the imagery of sport-related mastery experiences and arousal.

2. Practising sport skills

Hanrahan, Tetreau and Sarrazin (1995) investigated the use of imagery while performing dance movements. Three groups (no-treatment control, relaxation placebo and movement imagery) of 65 dance students performed various dance movements in the same pre- and post-test conditions. The results suggested that imagery can have a facilitatory effect, especially with large amplitude, ballistic or

sustained dance skills. This further dispels the belief that imagery is an inactive technique used by gullible athletes.

3. Improving motivation

Many of the elite athletes "see" themselves achieving their goals on a regular basis. Before or during training sessions, calling up images of one's goals for that session, or of a past or future competition or competitor can serve as a motivational purpose (Orlick, 1986).

Results from the study by Martin and Hall (1995) support the finding that imagery can have a motivational function. Thirty nine beginner golfers were randomly assigned to either an imagery treatment condition (performance plus outcome imagery or performance imagery or a no imagery control condition). During the first three sessions all subjects were taught how to putt a golf ball. Imagery treatment subjects also participated in an imagery training programme designed specifically for the golf putting task. For the final three sessions' subjects were told that the emphasis of the study was on performance. During the preperformance-oriented phase subjects in the performance imagery condition spent significantly more time practising a golf putting task than subjects in the control condition. Subjects who used imagery also set higher goals for themselves, had more realistic self-expectations, and were more adherent to their training programmes outside of the laboratory.

4. Coping with pain and injury

Imagery may also be used in the rehabilitation of injured athletes. In most cases, athletes are left with a rehabilitation programme housed in the traditional confines of a medical model that does not include a mind-body orientation. However, athletes may expedite their recovery by using cognitive strategies, such as imagery. Before an injury occurs imagery may be used to lessen the impact of stresses, and thus reduce the potential for injury. Imagery techniques that enhance relaxation and perspective on specific situations of stress may be developed and implemented throughout the season as circumstances mandate.

During the actual rehabilitation programme, the purpose of imagery is to facilitate the healing process, to promote the development of a positive and relaxed outlook towards recovery, to create the mind-set required for optimum performance, and to bring closure to the injury experience (Green, 1992).

5. Training under non-specific conditions

Imagery can play a significant role in training under non-specific conditions, provided that the imagery is carried out in conjunction with non-specific physical training. Van Gyn, Wenger and Gaul (1990) found that imagery can facilitate the transfer of physiological training to performance. Forty subjects were pretested on a Wingate cycle ergometer test for peak power and a 40 metre sprint. Subjects were assigned to one of four groups: imagery training, power training, imagery and power training, and control. Following a six week training period all subjects were retested. Even though both experimental groups who engaged in peak power cycle training (PT and IPT) significantly increased their peak power output from the pretest to the post-test, only the group who engaged in imagery of sprinting in conjunction with the peak power cycle training showed an improvement in the sprint time between pre- and post-test.

6. Improving concentration

Athletes can prevent their minds from wandering by visualising what they want to do and how they want to react in certain situations. Situations can be imagined where concentration is lost, but composure is retained, and the focus is on the next step or phase (Weinberg & Gould, 1995).

7. Controlling emotional responses

Mental imagery can be effectively used to familiarise oneself with all kinds of things, such as a competition site, a race course, an event focus plan, and a media interview plan. It can also form an integral part of the precompetition plan, which helps set the mental stage for a good performance. Finally, it can be useful in helping one to refocus when the need arises (Orlick, 1986).

8. Practising strategy

Mental imagery can be used to rehearse each set play, and to practise reacting to every eventuality until it becomes second nature. Using visualisation to increase one's familiarity with a wide range of tactical situations means that when they occur in reality reactions will be faster. Less information needs to be processed before the situation is recognised for what it is, and the appropriate response can therefore be initiated more quickly (Terry, 1989).

Imagery research

The information that does exist in imagery use is largely descriptive in nature, and has been collected through anecdotal reports of athletes, athlete interviews, and general postperformance questionnaires. Aspects such as which perspective athletes adopt, internal or external, and the extent to which athletes use kinaesthetic imagery in their performance preparation have received considerable attention (Hall et al., 1990).

Hall et al. (1990) administered a 37-item questionnaire to a sample of 381 male and female participants from six sports and found that those athletes competing at higher levels used imagery to a greater extent, both in training or just prior to competing. These findings also indicate that athletes use imagery more for performance enhancement than for skill learning. The athletes reported that their imagery sessions are not very structured (i.e. they do not plan in advance what they are going to imagine or for how long) and not very regular (i.e. at a specific time each day). It is obvious that most athletes do not think of approaching imagery practice and physical practice in the same way, but that they probably should. Athletes at all competitive levels seem to find it fairly easy to visualise and feel themselves performing their skills. Athletes at the higher competitive levels are more likely to use imagery before/in bed. Competitive athletes more often see themselves winning than do recreational/house league athletes. This probably has a motivational function.

Isaac and Marks (1994) administered the *Vividness of Visual Imagery Questionnaire* and the *Vividness of Movement Imagery Questionnaire* to 312 athletes from 16 different sporting disciplines. The findings suggest that in general athletes experience more vivid imagery in the visual and movement modalities than non-athletic matched controls. When analysing the differences between sporting groups in visual imagery, artistic athletes who perform to qualitative as well as purely objective criteria of performance, reported more vivid imagery than the other groups, i.e. gymnasts, trampolinists and synchronised swimming. The superior imagery ability in the artistic sports is possibly due to the requirement to employ an idealised action plan for the production and correction of highly rehearsed performance.

Guidelines for using imagery

To be effective, imagery should become part of the daily routine. It is important to tailor imagery programmes to the needs, abilities, and interests of each athlete (Gould & Damarjian, 1996). The following are guidelines for using imagery.

1. Practise imagery on a regular basis.
2. Use all senses to enhance image vividness.
3. Develop imagery control.
4. Use both internal and external perspectives.
5. Facilitate imagery through relaxation.
6. Develop coping strategies through relaxation.
7. Use imagery in practice and competition.
8. Use video- or audiotapes to enhance imagery skills.
9. Use triggers or cues to facilitate imagery qualities.
10. Emphasise dynamic kinaesthetic imagery.
11. Imagine in real time.
12. Use imagery logs.

Mental rehearsal summary

The findings from Hall et al. (1990) suggest that athletes do not think of approaching mental practice and physical practice in the same way, but that they should do. The advantages of mental practice have warranted the inclusion of it in any athlete's preparation. The following item determines whether the athlete regularly uses mental practice.

- *I set aside specific times to practise my sport in my imagination (visualisation).*

The guidelines for using imagery were discussed of which the following aspects were deemed appropriate for inclusion in the inventory. It is important that the athlete can control his image because it is difficult for the body to accomplish anything when the head is saying something to the contrary. These are the following items.

- *I can clearly visualise my previous sport performances in my imagination.*
- *I can clearly visualise my future sport performances in my imagination.*
- *I find it difficult to visualise clear mental pictures of my sport in my imagination.*

More successful athletes use imagery to a much greater extent, and more consistently in training and competition than less successful athletes. This is the emphasis of the following items.

- *I visualise my sport in my imagination during practice sessions.*
- *I visualise my sport in my imagination during competitions.*
- *I visualise my sport in my imagination just before going into an important competition.*

- *I use visualisation in the period just before the beginning of a competition.*

The type of imagery perspective (internal and external imagery) which is used is important because internal images result in more kinesthesia being experienced. The following items determine which kind of imagery perspective the athlete uses.

- *When I mentally practise my performance, I try to imagine what it will feel like in my muscles.*
- *When I mentally practise my performance, I see myself performing just like I was watching a videotape.*

Imagery can build confidence especially when successful experiences are imaged, and can help athletes overcome adversities. The following items determine whether athletes use their imagery to overcome difficult situations in sport.

- *I visualise dealing with setbacks and coping with difficult situations in my sport.*
- *If things go wrong during competition I am able to automatically apply strategies to cope with the situation.*

Coping Strategies

In sport psychology, there are a number of cognitive factors that affect sport performance (Van Raalte, Brewer, Rivera & Petitpas, 1994).

Gould, Eklund and Jackson (1993) identified and categorised the coping strategies used by the 20 members of the 1988 US wrestling team during their Olympic competition. The coping strategies employed include thought-control strategies, task-focus strategies, emotional-control strategies, and behavioural-

based strategies. Thought-control strategies were defined as efforts by the wrestlers to impose order or constraint on their thought processes. Task-focus strategies reflected efforts by the wrestlers to control their thought content by focusing on the task at hand and concentrating on their goals. Emotional-control strategies included arousal control and visualisation techniques, and were efforts by the wrestlers to control their feeling state or activation level. Behavioural-based strategies were defined as coping efforts characterised by overt behavioural responses, including changing or controlling the environment and following a predetermined familiar routine that helped the wrestlers minimise uncertainty and to focus attention.

Thought-control strategies were employed by the highest percentage of wrestlers (80 percent), whereas task-focus, emotional control, and behavioural strategies were reflected in a much smaller number of transcripts (40 percent). The coping efforts of the Olympic wrestlers were not limited to particular strategies nor single approaches to dealing with a particular stressor. The reason being that coping is a dynamic complex process involving any number of strategies often in combination (Gould et al., 1993).

The most frequently mentioned coping strategies for national champion figure skaters were rational thinking and self-talk and precompetitive mental preparation and anxiety management strategies. Coping dimensions and higher-order themes that also emerged included social support, time management and prioritisation, training hard and smart, ignoring, and reactive behaviour. The link between coping strategy dimension and stress source was also investigated. When faced with physical or psychological demands, more than half of the skaters used rational thinking and self-talk, changing to healthy eating attitudes and behaviours, precompetitive mental preparation, and anxiety management. When the skaters encountered environmental demands, time management and prioritisation and isolation were the most frequently used coping strategies (Gould et al., 1993).

Self-talk

What athletes say to themselves is not always conducive to good performance, and all too often is at the root of poor performance. This can cause the athlete to choke. Choking can be defined as the inability to perform up to previously exhibited standards. Leith (1988) found that talking about choking has a negative effect on the performance of a motor task. One such situation occurs when an athlete performs flawlessly in practice but not in a game situation.

Self-talk occurs whenever an athlete thinks, whether that athlete is making statements internally or externally. Sport and exercise psychologists are more concerned with athletes' self-statements that direct attention (focus or label the self or others), judge performances (great shot), and contribute to or undermine good performance. Self-talk serves as the vehicle for making perceptions and beliefs conscious, thereby providing the key to gaining cognitive control (Bunker, Williams & Zinsser, 1993).

There are three types of self-talk statements that are conducive to increasing performance levels.

1. Task-relevant statements

These involve the technical and tactical aspects of the sport and are required to control the form of the activities in question. For example, running: pacing, intensity, breathing, control (Rushall, 1989).

2. Mood words

These are basic or primitive words which when said or thought, have some movement or emotional component. They cause physical reaction in the body. For example: the word "crunch" conveys the feeling of strength (Rushall, 1989).

3. Positive self-statements

These are positive phrases that are meaningful to the athlete and maintain the effort of application. They are meaningless, cheerleader-type expressions, but should be relevant to the task at hand. For example, "go, go, go" (Rushall, 1989). Although many athletes and sport psychologists believe best performances occur with no conscious thinking (automatic performance), it is probably unrealistic to expect athletes to shut off all thinking during every performance (Bunker et al., 1993). The basic question is: What should athletes think about during competition to produce maximum performance?

The belief that self-talk affects competitive sport performance (Gould, Hodge, Peterson & Giannini, 1989; Mahoney & Avener, 1977; Weinberg, Grove & Jackson, 1992) has led to the implementation of techniques such as thought stopping, cognitive restructuring, and countering to reduce the occurrence of negative self-talk and increase the occurrence of positive self-talk. Self talk can help athletes in the following ways (Williams & Leffingwell, 1996).

1. Correcting bad habits
2. Focusing attention
3. Modifying activation
4. Increasing self-confidence
5. Increasing efficacy and maintaining exercise behaviour
6. Retrospection
7. Imagery
8. Observation
9. Thought stoppage
10. Changing negative thoughts to positive thoughts
11. Centering
12. Reframing
13. Countering

Assessments of the relationship between self-reported self-talk and sport performance have produced equivocal findings. Dagrou, Gauvin and Halliwell.

(1991) found that athletes showed the same self-talk strategies before and after races both in their best and worst performances. Highlen and Bennett (1983) found that elite divers who qualified for the Pan American Games reported using more content-based self-instructions during competition and less positive self-talk than did nonqualifiers. Wrestlers who qualified for the Pan American Games reported using more critical self-talk during competition than nonqualifiers. Rotella et al. (1980) found that more successful elite skiers did not differ from less successful skiers in terms of self-talk used.

Research examining the effects of self-talk on performance indicates that negative self-talk is associated with worst performance (Dagrou et al., 1991; Van Raalte et al., 1994), and that positive self-talk is associated with better performances (Johnston-O' Connor & Kirschenbaum, 1986), or no different performances (Van Raalte, et al., 1994; Weinberg, 1985).

Discrepant findings have therefore been found in the relationship between self-talk and performance. One explanation for these discrepancies is that negative self-talk may be more detrimental to performance of new skills than to performance of well-learned skills (Van Raalte et al., 1994). Positive self talk can also be used internally by the athlete, and therefore not be observed by the raters.

Hill and Bourden (1995) investigated the effect of attentional cueing scripts on competitive bowling performance. Attentional cueing scripts consist of a series of self-talk phrases, images and attentional focus points designed to guide the athlete's attention during competition. It is a self-regulatory mechanism that tells the athlete what to think about, and when to think about it during the contest. The study showed that attentional cueing scripts were associated with significant improvements during competitive bowling performance.

Preperformance routines

A variety of cognitive and behavioural strategies may be implemented into preperformance routines. Research on such strategies shows that athletes can learn to develop consistent highly systematic preparatory routines and that routines benefit performance. However, the findings of the effects of routines on performance has been erratic because many studies investigated the effects of routines on performance over a period of time. This made it difficult to determine whether improved performance was due to the implementation of the routine, physical practice, or both. Some of the research on routines have been conducted with high level athletes that presents the problem of having a ceiling effect on performance, but which minimise the impact of the effects of the treatment on performance (Cohn, 1990).

Deci, Eghrari, Patrick and Leone (1994) determined whether a cognitive-behavioural programme designed for golf can lead to better preparation and performance. The results showed that novice golfers quickly learned to use the preputt routines they had been taught in the cognitive-behavioural programme. The preputt observational measures indicated that the cognitive-behavioural control group took a significantly longer time, more swings, and more looks at the target per putting routine over time than both the physical skills control group at the 10-week and 14-week time assessments. Clear performance differences emerged only for the cognitive behavioural group after the 14th week.

Beauchamp, Halliwell, Fournier and Koestner (1996) compared the effects of a cognitive-behavioural programme with a physical skills intervention and a no-training control group on novice golfer's motivation, preputt preparation, and putting performance. The results showed that all three outcomes were significantly affected by the cognitive-behavioural programme. Novice golfers who were taught with a cognitive-behavioural focus reported greater intrinsic motivation and less use of introjection than similar golfers who were in either the physical skills teaching programme or a control group. Novice golfers in the

cognitive-behavioural programme also displayed more elaborate preparations prior to putting and more accurate performance when placed in a test situation.

Coping strategy summary

When athletes experience difficulties in sport they need to come up with a coping strategy to rectify the situation. An extremely helpful coping strategy is that of self talk. Self-talk serves as a vehicle for making perceptions and beliefs conscious, thereby providing cognitive control. However, what athletes say to themselves is not always conducive to good performance, especially self-statements that distract attention and undermine good performance. The following items appear in other psychological skill items, and are indicated in brackets.

- *My thoughts interfere with my performance during important competitions. (concentration)*
- *I can effectively block out negative thoughts during important competitions. (concentration)*
- *I visualise dealing with setbacks and coping with difficult situations in my sport. (mental rehearsal)*
- *I can quickly refocus my concentration after becoming distracted during important competitions. (concentration)*
- *I think positive thoughts before important competitions. (concentration)*
- *If things go wrong during competition I am able to automatically apply strategies to cope with the situation. (mental rehearsal)*
- *I know how to make myself relax in difficult situations. (anxiety control)*
- *If I lose confidence during a competition I know how to recover it. (maintaining confidence)*

Conclusion

A number of psychological skills have been discussed that influence performance, namely achievement motivation, goal setting, anxiety control, maintaining confidence, concentration, mental rehearsal, and coping strategies.

Achievement motivation is the tendency to strive for success, persist in the face of failure, and experience pride in accomplishments. An athlete's competitiveness and achievement motivation influences a wide variety of behaviours, thoughts, and feelings. According to the **goal-setting** theory task performance is regulated directly by the conscious goals that athletes are trying for on a task. Sport can be experienced as extremely stressful. Very often athletes see these situations as negative, which results in anxiety. Athletes need to learn to minimise the frequency and intensity of this **anxiety** by learning mental and physical skills and strategies. Having sufficient **confidence** means being convinced that goals can be achieved if enough effort is put in to a task. Maximal sport performance occurs when intense **concentration** of attention is focused on a limited stimulus field where only relevant cues are processed from the multitude available. **Mental rehearsal** improves both physical and psychological skills, by building confidence, improving motivation, coping with pain and injury, improving concentration, practising strategy and controlling emotional responses. By initiating **coping strategies** any problems experienced in these aspects can be rectified.

Chapter five

Statistical analysis, conclusions and recommendations

A provisional inventory of 82 items, consisting of six psychological skills was developed by the following procedures:

- consultation of sport psychology literature
- identification of articles characterising successful athletes
- analysis of research articles pertaining to the psychological skills
- review of available psychological tests.

The number of items each psychological skill consisted of was the following:

- achievement motivation 16
- goal setting 12
- anxiety control 15
- maintaining confidence 13
- concentration 14
- mental rehearsal 12

Athletes responded to statements by means of a 5-point Likert scale, with the options of *never, rarely, sometimes, often,* and *always.* The scoring ranged from *never* (0) to *always* (4). The scoring is reversed for 27 items from always (0) to never (4). For example, *"I worry about making mistakes in important competitions."* The main statistical tool used was *Spearman's Rank Order Correlations,* from the statistical package called *Statistica.* The analysis involved determining the mean scores of English and Afrikaans respondents, male and female respondents, and the psychological skills of the different achievement levels. Each item was correlated with the age, year and achievement level of the respondent.

It was completed by students from the Department of Human Movement Science at the University of Stellenbosch. Three hundred and four inventories were processed (1st year = 132, 2nd year = 80, 3rd year = 72, 4th year = 20). The mean age of the participants was 20.22 years. There were exactly the same number of English (152) and Afrikaans (152) respondents. More females (158) than males (146) completed the inventory. As a result of the large sample size the correlations are more significant ($p< 0.05$).

The respondents were required to complete an anonymous three-item questionnaire to ensure the reliability of the results. They were required to answer the inventory according to how they truly and honestly felt. Most respondents (70%) did not answer the inventory according to how they thought their coach would want them to respond. A test-retest was performed on the final administration of the inventory by 22 post-graduate students. A one-week period separated the second application from the initial inventory. Results were analysed according to each psychological skill. The correlation was extremely high as can be seen in Table 5.1.

Table 5.1 *Test-retest correlations*

Psychological skill	***r***
Achievement motivation	0.97
Goal setting	0.92
Anxiety control	0.87
Maintaining confidence	0.79
Concentration	0.91
Mental rehearsal	0.84

The respondents represented a wide range of sports, including badminton, basketball, biathlon, bodybuilding, canoeing, cricket, cross-country racing,

dancing, diving, duathlon, golf, gymnastics, hockey, judo, karate, netball, paragliding, rugby, sailing, soccer, squash, surfing, synchronised swimming, target shooting, track and field athletics, triathlon, underwaterhockey, volleyball, waterpolo, and weightlifting.

Language differences

No significant differences were found between English and Afrikaans respondents on the mean scores of all six psychological scores. This indicates that the translation of the inventory did not have an effect on the meaning of the items.

Age differences

Each item was correlated with the age and the year of the respondent. The results indicated a strong correlation of r = 0.25 with the item, *"My sport is the most important activity that I do."* This indicated that sport becomes less important in life with an increase in age, and study year. This could be due to the fact that the older students now realise that their chances of reaching an elite level in sport decreases with age, and that it is more important to concentrate on for example, their degree to ensure a stable career path.

Gender differences

Male students achieved higher mean scores (Figure 5.1) than the female students on all the psychological skills except goal setting. The largest differences were with maintaining confidence and mental rehearsal.

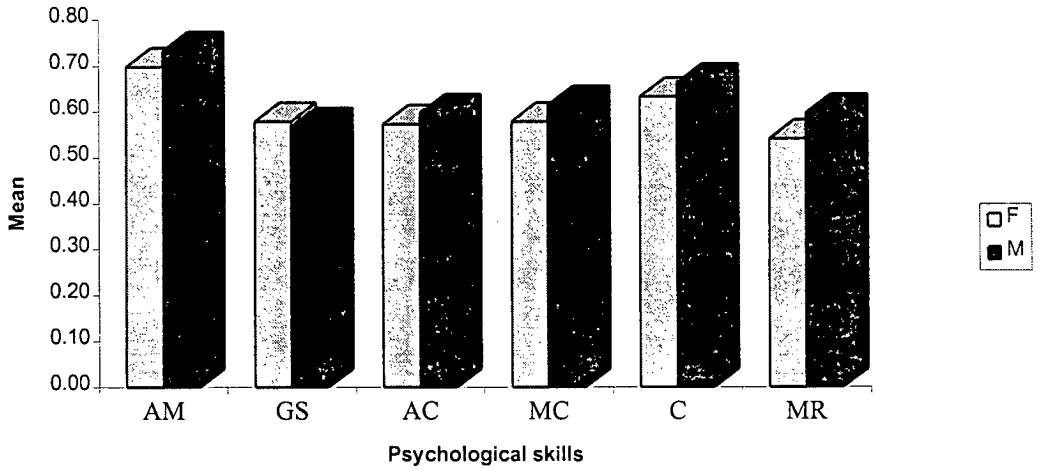

Figure 5.1 *Comparison of scores obtained by male and female students*

Note. AM = achievement motivation; GS = goal setting; AC = anxiety control; MC = maintaining confidence; C = concentration; MR = mental rehearsal; F = female students; M = male students

Correlation between psychological skills

Most psychological skills correlated well with each other, as indicated in Table 5.2. The exceptions being that of mental rehearsal and maintaining confidence, and mental rehearsal and anxiety control where there was a weak relationship. Achievement motivation had a substantial relationship with anxiety control and maintaining confidence. Goal setting and mental rehearsal also correlated substantially with each other. Anxiety control correlated highly with maintaining confidence and concentration, while they in turn had a high correlation with each other. Achievement motivation also had a strong relationship with concentration.

Table 5.2 *Correlation between psychological skills*

	AM	GS	AC	MC	C	MR
AM	1	0.46	0.59	0.64	0.72	0.35
GS	--	1	0.26	0.30	0.35	0.52
AC	--	--	1	0.78	0.70	0.14
MC	--	--	--	1	0.78	0.20
C	--	--	--	--	1	0.30
MR	--	--	--	--	--	1

Achievement level differences

The data were divided into seven levels according to the students' achievement in sport. These levels were then grouped into, group one (levels 1.1-1.4) and group two (levels 2.1-2.3) for analysis. Group one consisted of 245 respondents and group two of 59 respondents.

Group one	***Group 2***
1.1 social	*2.1 national school*
1.2 school	*2.2 provincial senior*
1.3 club	*2.3 national senior*
1.4 provincial school	

Figure 5.2 shows that group two faired better than group one on all the psychological skills. The biggest difference can be observed in goal setting (group one: M = 0.56 and group two: M = 0.62) and mental rehearsal (group one: M = 0.55 and group two: M = 0.61). One could therefore assume that there would be a greater difference if level 1.1 was compared to 2.3.

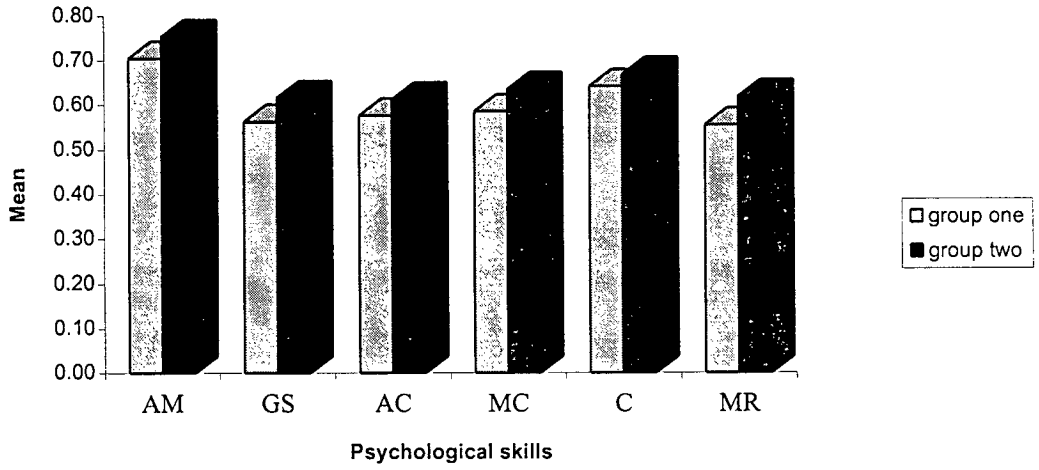

Figure 5.2 *Comparison of psychological skills scores between group one and group two*

Note. group one = levels 1.1-1.4; group two = levels 2.1-2.3

Correlation between individual items and achievement level

An important facet of this research was to determine which items were able to differentiate successful from less successful athletes. The 16 most highly correlated items appear in Table 5.3. Although all the correlations were statistically significant ($p< 0,05$) they were weak.

Table 5.3 *Spearman rank order correlation between individual items and achievement level*

Item	*r*
I can handle the unexpected stress during important competitions.	0.11
I set goals for my sport.	0.12
I set aside specific times to practise my sport in my imagination (visualisation).	0.12
I prefer easy competitions to difficult competitions.	0.13
Winning in sport is very important to me.	0.13
I enjoy the challenges of important competitions.	0.13
I visualise my sport in my imagination just before going into an important competition.	0.13
Before important competitions I am confident that I will perform well.	0.14
I have doubts about my ability in sport.	0.15
I visualise my sport in my imagination during competitions.	0.16
I perform better in important competitions than in practice sessions.	0.16
When I practise my sport in my imagination, I see myself performing just like I was watching a videotape.	0.18
I a tough competitor.	0.18
My sport is the most important activity that I do.	0.19
I write down my goals for my sport.	0.20
I am motivated to excel in my sport.	0.21

Contribution of each item to its psychological skill

Each item was correlated with the total score of the psychological skill to which it belonged, to determine how much it contributed to its total. Table 5.4 shows those items which achieved the best scores in each of the psychological skills.

Table 5.4 *Item contributing most to each total psychological skill score*

Psychological skill	Item	*r*
Achievement motivation	I am motivated to excel in my sport.	0.68
Goal setting	I set specific goals for every competition.	0.77
Anxiety control	I worry about failing in important competitions.	0.64
Maintaining confidence	When I begin to perform poorly, my confidence drops quickly.	0.73
Concentration	I can effectively block out negative thoughts during important competitions.	0.73
Mental rehearsal	I visualise my sport in my imagination just before going into an important competition.	0.79

Discussion

The aspect which formed the basis for retaining or eliminating an item is the following:

- contribution of each item to its total psychological skill

The 10 best correlated items from each psychological skill were selected for inclusion in the final inventory. The exceptions being that of an item in the psychological skills, mental rehearsal and concentration. The item with the lowest correlation was from the psychological skill anxiety control with r = 0.49. It was deemed necessary to include the concentration item, *"I use fixed routines or rituals before competitions,"* although it had a weak correlation. Five of the items left out of the final inventory had a significant correlation with achievement level. These were:

- *Winning in sport is very important to me. (achievement motivation)*

- *My sport is the most important activity that I do. (achievement motivation)*
- *I prefer easy competitions to difficult competitions. (achievement motivation)*
- *I perform better in important competitions than in practice sessions. (anxiety control)*
- *When I practise my sport in my imagination, I see myself performing just like I watching a videotape.*

Table 5.5 shows the correlation of each achievement motivation item to the total achievement motivation score. Items are ranked from a low to a high correlation.

Table 5.5 *Spearman rank order correlations between individual items and total achievement motivation score*

Item	***r***
After the competition is over, I feel that I could have performed better.	0.11
Luck plays an important part in my sporting achievements.	0.26
Winning in sport is very important to me.	0.35
I prefer easy competitions to difficult competitions.	0.46
My sport is the most important activity that I do.	0.46
I would miss a training session if another interesting opportunity arose.	0.48
I strive for better performances.	0.51
If I get behind in a competition I feel that winning is impossible.	0.51
I am enthusiastic at practice sessions.	0.53
I am able to bounce back after a disappointing performance.	0.55
I can persevere at my sport, even when I am very tired.	0.57

(table continues)

Table 5.5 *(continued)*

Item	***r***
If the odds are against winning, I am still able to produce my best effort.	0.58
I am good at motivating myself.	0.62
I look forward to important competitions.	0.63
I am a tough competitor.	0.66
I am motivated to excel in my sport.	0.68

The following items from the psychological skill, **achievement motivation** were eliminated after the statistical analysis.

- *After the competition is over, I feel that I could have performed better.*
- *Luck plays an important part in my sporting achievements.*
- *Winning in sport is very important to me.*
- *I prefer easy competitions to difficult competitions.*
- *My sport is the most important activity that I do.*
- *I would miss a training session if another interesting opportunity arose.*

The following items from the psychological skill, **achievement motivation** were retained after the statistical analysis. The word *"fall"* was replaced with *"get"* in the item" *"If I (fall) get behind in a competition I feel that winning is impossible".*

- *I strive for better performances.*
- *If I (fall) get behind in a competition I feel that winning is impossible.*
- *I am enthusiastic at practice sessions.*
- *I am able to bounce back after a disappointing performance.*
- *I can persevere at my sport, even when I am very tired.*
- *If the odds are against winning, I am still able to produce my best effort.*

- *I am good at motivating myself.*
- *I look forward to important competitions.*
- *I am a tough competitor.*
- *I am motivated to excel in my sport.*

Table 5.6 shows the correlation of each **goal-setting** item to the total goal setting score. Items are ranked from a low to a high correlation.

Table 5.6 *Spearman rank order correlations between individual items and total goal setting score*

Item	***r***
I set goals so that I will not experience failure.	-0.30
I tell other important people what my goals are.	0.42
I write down goals for my sport.	0.55
I, myself set my goals for my sport.	0.58
My goals all have deadlines attached to them.	0.64
I set realistic, but challenging goals for my sport.	0.65
I set goals for my sport.	0.69
On a daily or weekly basis I set very specific goals for myself that guide what I do.	0.70
I set specific goals for each practice session.	0.71
I monitor the progress towards my goals.	0.73
My specific goals are structured to lead me to my eventual long-term goal.	0.73
I set specific goals for every competition.	0.77

The following items from the psychological skill, **goal setting** were eliminated after the statistical analysis.

- *I set goals so that I will not experience failure.*
- *I tell other important people what my goals are.*

The following items from the psychological skill, **goal setting** were retained after the statistical analysis.

- *I write down my goals for my sport.*
- *I, myself, set my goals for my sport.*
- *My goals all have deadlines attached to them.*
- *I set realistic, but challenging goals for my sport.*
- *I set goals for my sport.*
- *On a daily or weekly basis I set very specific goals for myself that guide what I do.*
- *I set specific goals for each practice session.*
- *I monitor the progress towards my goals.*
- *My specific goals are structured to lead me to my eventual long-term goal.*
- *I set specific goals for every competition.*

Table 5.7 shows the correlation of each **anxiety control** item to the total anxiety control score. Items are ranked from a low to a high correlation.

Table 5.7 *Spearman rank order correlations between individual items and total anxiety control score*

Item	*r*
When I become tense during important competitions I can recognise the signs of nervousness in myself.	0.01
I am more tense before than during important competitions.	0.27
Before I compete in important competitions I get tense.	0.30
My nervousness helps me to perform better during important competitions.	0.39
I perform better in important competitions than in practice sessions.	0.44
I am concerned that others will be disappointed with my performance in important competitions.	0.49
I enjoy the challenges of important competitions.	0.52
The more important the competition the more enjoyable it is for me.	0.58
I know how to make myself relax in difficult situations.	0.58
I worry about making mistakes in important competitions.	0.58
When I make a mistake during important competitions I become nervous.	0.59
I can handle the unexpected stress during important competitions.	0.62
Before I compete in important competitions I worry about not performing well.	0.62
I can control my nervousness before important competitions.	0.64
I worry about failing in important competitions.	0.64

The following items from the psychological skill, **anxiety control** were eliminated after the statistical analysis.

- *When I become tense during important competitions I can recognise the signs of nervousness in myself.*
- *I am more tense before than during important competitions.*
- *Before I compete in important competitions I get tense.*
- *My nervousness helps me to perform better during important competitions.*
- *I perform better in important competitions than in practice sessions.*

The following items from the psychological skill, **anxiety control** were retained after the statistical analysis.

- *I am concerned that others will be disappointed with my performance in important competitions.*
- *I enjoy the challenges of important competitions.*
- *The more important the competition the more enjoyable it is for me.*
- *I know how to make myself relax in difficult situations.*
- *I worry about making mistakes in important competitions.*
- *When I make a mistake during important competitions I become nervous.*
- *I can handle the unexpected stress during important competitions.*
- *Before I compete in important competitions I worry about not performing well.*
- *I can control my nervousness before important competitions.*
- *I worry about failing in important competitions.*

Table 5.8 shows the correlation of each **maintaining confidence** item to the total maintaining confidence score. Items are ranked from a low to a high correlation.

Table 5.8 *Spearman rank order correlations between individual items and total maintaining confidence score*

Item	*r*
My previous performances have an effect on my subsequent performances.	0.32
I practice the conditions I am likely to experience in the competitive situation.	0.34
I am concerned about losing during important competitions.	0.52
Before important competitions I am confident that I can meet the challenges.	0.63
If I lose confidence during a competition I know how to recover it.	0.63
Before important competitions I am confident that I will perform well.	0.64
I experience thoughts of failure during important competitions.	0.65
I have doubts about my ability in sport.	0.66
Before important competitions I am confident that I can handle the pressure.	0.66
I feel threatened by important competitions.	0.67
My confidence tends to drop as an important competition draws nearer.	0.69
Before an important competition I am concerned that I may not do as well as I could.	0.72
When I begin to perform poorly, my confidence drops quickly.	0.73

The following items from the psychological skill, **maintaining confidence** were eliminated after the statistical analysis.

- *My previous performances have an effect on my subsequent performances.*

- *I practice the conditions I am likely to experience in the competitive situation.*
- *I am concerned about losing during important competitions.*

The following items from the psychological skill, **maintaining confidence** were retained after the statistical analysis.

- *Before important competitions I am confident that I can meet the challenges.*
- *If I lose confidence during a competition I know how to recover it.*
- *Before important competitions I am confident that I will perform well.*
- *I experience thoughts of failure during important competitions.*
- *I have doubts about my ability in sport.*
- *Before important competitions I am confident that I can handle the pressure.*
- *I feel threatened by important competitions.*
- *My confidence tends to drop as an important competition draws nearer.*
- *Before an important competition I am concerned that I may not do as well as I could.*
- *When I begin to perform poorly, my confidence drops quickly.*

Table 5.9 shows the correlation of each **concentration** item to the total concentration score. Items are ranked from a low correlation to a high correlation.

Table 5.9 *Spearman rank order correlations between individual items and total concentration score*

Item	*r*
I use fixed routines or rituals before competitions.	0.22
I deliberately practice concentrating during practice sessions.	0.42
I think positive thoughts before important competitions.	0.54
When I make a mistake, I have difficulty forgetting it and concentrating on my performance.	0.55
When I compete I concentrate on what I am doing at that specific moment rather than on what lies ahead.	0.58
My concentration lets me down during important competitions.	0.60
When unexpected things happen during important competitions it disrupts my concentration.	0.62
I have trouble concentrating during important competitions.	0.63
Negative remarks by other people (such as spectators or opponents) upset me during important competitions.	0.63
When a competition is not going well my concentration is easily distracted.	0.64
During a competition I continue to concentrate well even after making a mistake.	0.64
I can quickly refocus my concentration after becoming distracted during important competitions.	0.68
My thoughts interfere with performance during important competitions.	0.68
I can effectively block out negative thoughts during important competitions.	0.73

The following items from the psychological skill, **concentration** were eliminated after the statistical analysis.

- *I deliberately practice concentrating during practice sessions.*
- *I think positive thoughts before important competitions.*
- *When I make a mistake, I have difficulty forgetting it and concentrating on my performance.*
- *When I compete I concentrate on what I am doing at that specific moment rather than on what lies ahead.*

The following items from the psychological skill, **concentration** were retained after the statistical analysis.

- *I use fixed routines or rituals before competitions.*
- *My concentration lets me down during important competitions.*
- *When unexpected things happen during important competitions it disrupts my concentration.*
- *I have trouble concentrating during important competitions.*
- *Negative remarks by other people (such as spectators or opponents) upset me during important competitions.*
- *When a competition is not going well my concentration is easily distracted.*
- *During a competition I continue to concentrate well even after making a mistake.*
- *I can quickly refocus my concentration after becoming distracted during important competitions.*
- *My thoughts interfere with my performance during important competitions.*
- *I can effectively block out negative thoughts during important competitions.*

Table 5.10 shows the correlation of each **mental rehearsal** item to the total mental rehearsal score. Items are ranked from a low correlation to a high correlation.

Table 5.10 *Spearman rank order correlations between individual items and total mental rehearsal score*

Item	*r*
If things go wrong during competition I am able to automatically apply strategies to cope with the situation.	0.24
I can clearly visualise my previous sport performance in my imagination.	0.51
I find it difficult to visualise clear mental pictures of my sport in my imagination.	0.51
I visualise dealing with setbacks and coping with difficult situations in my sport.	0.59
When I mentally practise my performance, I try to imagine what it will feel like in my muscles.	0.60
I visualise my sport in my imagination during practice sessions.	0.64
When I practise my sport in my imagination, I see myself performing just like I was watching a videotape.	0.66
I can clearly visualise my future sport performances in my imagination.	0.67
I set aside specific times to practise my sport in my imagination (visualisation).	0.68
I visualise my sport in my imagination during competitions.	0.73
I use visualisation in the period just before the beginning of a competition.	0.78
I visualise my sport in my imagination just before going into an important competition.	0.79

The following items from the psychological skill, **mental rehearsal** were eliminated after the statistical analysis. Although the item, *"When I practise my*

sport in my imagination, I see myself performing just like I was watching a videotape" had a high correlation it was not included in the final inventory.

- *If things go wrong during competition I am able to automatically apply strategies to cope with the situation.*
- *When I practise my sport in my imagination. I see myself performing just like I was watching a videotape.*

The following items from the psychological skill, **mental rehearsal** were retained after the statistical analysis. The word *'imagery"* was added to the item: *"I set aside specific times to practise my sport in my imagination (visualisation/imagery)."*

- *I can clearly visualise my previous sport performance in my imagination.*
- *I find it difficult to visualise clear mental pictures of my sport in my imagination.*
- *I visualise dealing with setbacks and coping with difficult situations in my sport.*
- *When I mentally practise my performance, I try to imagine what it will feel like in my muscles.*
- *I visualise my sport in my imagination during practice sessions.*
- *I can clearly visualise my future sport performances in my imagination.*
- *I set aside specific times to practise my sport in my imagination (visualisation).*
- *I visualise my sport in my imagination during competitions.*
- *I use visualisation in the period just before going into an important competition.*
- *I visualise my sport in my imagination just before going into an important competition.*

Conclusion

A provisional inventory of 82 items was developed to assess the psychological skills of athletes. The inventory was completed by 304 students from the Department of Human Movement Science at the University of Stellenbosch. The following aspects formed part of the statistical analysis: language, age, and gender differences, correlation between psychological skills, achievement level differences, correlation between individual item and achievement level, and the contribution of each item to its psychological skill. Results from the statistical analysis indicated that the inventory was able to differentiate between successful and less successful athletes on the psychological skills of achievement motivation, goal setting, anxiety control, maintaining confidence, concentration, and mental rehearsal. The inventory was available in English and Afrikaans, with similar results being obtained in both languages. The 10 best correlated items from each psychological skill were included in the final inventory resulting in a total of 60 items. A test-retest was performed on the final inventory to determine its reliability. The results indicated a strong correlation for all the psychological skills. The final inventory appears in the appendix along with the scoring sheet and the anonymous three item questionnaire.

Recommendations

The inventory needs to be subjected to more testing. The validity of the inventory needs to be determined by correlating it with other inventories or measures.

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Appendix A

Psychological Skills Inventory

Name:

Age:

Sport:

Level of participation:

In order for you to get some use from this inventory it is important that you respond to the statements as honestly as possible. Information provided by you is **confidential** and will not be available to any person other than yourself and the sport psychologist.

- This inventory consists of a number of statements about the experience of competitive sport.
- Read each statement carefully then indicate how it applies to you when you compete in important competitions.
- There are no correct or incorrect answers. All you are required to do is to consider each statement in terms of your own sporting experience.

1. **I can persevere at my sport, even when I am very tired.**

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

2. **I set goals for my sport.**

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

3. **Before I compete in important competitions I worry about not performing well.**

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

4. **If I lose confidence during a competition I know how to recover it.**

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

5. **I use fixed routines or rituals before competitions.**

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

6. **I set aside specific times to practise my sport in my imagination (visualisation/imagery).**

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

7. **If the odds are against winning, I am still able to produce my best effort.**

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

8. **On a daily or weekly basis I set very specific goals for myself that guide what I do.**

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

9. **I worry about making mistakes in important competitions.**

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

10. I feel threatened by important competitions.

□Never □Rarely □Sometimes □Often □Always

11. During a competition I continue to concentrate well even after making a mistake.

□Never □Rarely □Sometimes □Often □Always

12. I can clearly visualise my future sport performances in my imagination.

□Never □Rarely □Sometimes □Often □Always

13. If I get behind in a competition I feel that winning is impossible.

□Never □Rarely □Sometimes □Often □Always

14. I set realistic, but challenging goals for my sport.

□Never □Rarely □Sometimes □Often □Always

15. The more important the competition the more enjoyable it is for me.

□Never □Rarely □Sometimes □Often □Always

16. Before important competitions I am confident that I can handle the pressure.

□Never □Rarely □Sometimes □Often □Always

17. I have trouble concentrating during important competitions.

□Never □Rarely □Sometimes □Often □Always

18. I find it difficult to visualise clear mental pictures of my sport in my imagination.

□Never □Rarely □Sometimes □Often □Always

19. I am able to bounce back quickly after a disappointing performance.

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

20. I write down my goals for my sport.

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

21. I enjoy the challenges of important competitions.

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

22. I experience thoughts of failure during important competitions.

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

23. When unexpected things happen during important competitions it disrupts my concentration.

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

24. I visualise my sport in my imagination during practice sessions.

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

25. I strive for better performances.

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

26. I monitor the progress towards my goals.

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

27. I can control my nervousness before important competitions.

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

28. Before important competitions I am confident that I can meet the challenges.

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

29. My concentration lets me down during important competitions.

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

30. I visualise my sport in my imagination during competitions.

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

31. I am good at motivating myself.

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

32. I set specific goals for each practice session.

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

33. I can handle the unexpected stress during important competitions.

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

34. I have doubts about my ability in sport.

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

35. My thoughts interfere with my performance during important competitions.

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

36. I visualise my sport in my imagination just before going into important competitions.

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

37. I am motivated to excel in my sport.

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

38. I set specific goals for every competition.

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

39. I worry about failing in important competitions.

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

40. My confidence tends to drop as an important competition draws nearer.

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

41. I can effectively block out negative thoughts during important competitions.

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

42. I visualise dealing with setbacks and coping with difficult situations in my sport.

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

43. I look forward to important competitions.

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

44. My specific goals are structured to lead me to my eventual long-term goal.

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

45. I know how to make myself relax in difficult situations.

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

46. When I begin to perform poorly, my confidence drops quickly.

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

47. Negative remarks by other people (such as spectators or opponents) upset me during important competitions.

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

48. I use visualisation in the period just before the beginning of a competition.

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

49. I am a tough competitor.

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

50. My goals all have deadlines attached to them.

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

51. When I make a mistake during important competitions I become nervous.

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

52. Before an important competition I am concerned that I may not do as well as I could.

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

53. I can quickly refocus my concentration after becoming distracted during important competitions.

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

54. When I mentally practise my performance, I try to imagine what it will feel like in my muscles.

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

55. I am enthusiastic at practise sessions.

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

56. I, myself, set my goals for my sport.

☐Never ☐Rarely ☐Sometimes ☐Often ☐Always

57. I am concerned that others will be disappointed with my performance in important competitions.

□Never □Rarely □Sometimes □Often □Always

58. Before important competitions I am confident that I will perform well.

□Never □Rarely □Sometimes □Often □Always

59. When a competition is not going well my concentration is easily distracted.

□Never □Rarely □Sometimes □Often □Always

60. I can clearly visualise my previous sport performances in my imagination.

□Never □Rarely □Sometimes □Often □Always

Thank you

Appendix B

Anonymous three item questionnaire

1. I answered this inventory the way I truly and honestly felt.

□Yes □No

2. I answered this inventory according to how I thought my coach would like me to answer.

□Yes □No

3. I answered this inventory so that I would give the best impression of myself.

□Yes □No

Appendix C

Sielkundige Vaardighede Inventaris

Naam:

Ouderdom:

Sport:

Vlak van deelname:

Ten einde enige nut uit hierdie vraelys te kry, is dit belangrik dat jy so eerlik moontlik op elk van die stellings reageer. Die inligting wat jy verskaf is **vertroulik** en is nie beskikbaar vir enige persoon behalwe jouself en die sportsielkundige nie.

- Hierdie inventaris bestaan uit stellings oor ervarings in mede-dingende sport.

- Lees elke stelling noukeurig en dui aan hoe dit op jou van toepassing is wanneer jy meeding in belangrike kompetisies.

- Daar is geen regte of verkeerde antwoorde nie. Al wat van jou verwag word is om elke stelling te oorweeg in terme van jou eie sportervaring.

1. **Ek kan volhou met my sport selfs as ek baie moeg is.**

□Nooit □Selde □Soms □Dikwels □Altyd

2. **Ek stel mikpunte vir my sport.**

□Nooit □Selde □Soms □Dikwels □Altyd

3. **Voor ek deelneem aan belangrike kompetisies, is ek bekommerd dat ek nie goed sal vaar nie.**

□Nooit □Selde □Soms □Dikwels □Altyd

4. **As ek vertroue verloor tydens 'n kompetisie weet ek hoe om dit te herwin.**

□Nooit □Selde □Soms □Dikwels □Altyd

5. **Ek volg vaste roetines of rituele voor kompetisies.**

□Nooit □Selde □Soms □Dikwels □Altyd

6. **Ek reserveer spesifieke tye om my sport in my verbeelding te beoefen (visualisering/beelding).**

□Nooit □Selde □Soms □Dikwels □Altyd

7. **As die kanse vir 'n oorwinning onwaarskynlik is, kan ek nog steeds my beste lewer.**

□Nooit □Selde □Soms □Dikwels □Altyd

8. **Op 'n daaglikse of weeklikse basis stel ek vir myself baie spesifieke mikpunte om my te lei in wat ek doen.**

□Nooit □Selde □Soms □Dikwels □Altyd

9. **Ek bekommer my dat ek foute sal maak tydens belangrike kompetisies.**

□Nooit □Selde □Soms □Dikwels □Altyd

10. Ek ervaar belangrike kompetisies as bedreigend.

□Nooit □Selde □Soms □Dikwels □Altyd

11. Ek hou aan om goed te konsentreer selfs as ek 'n fout maak tydens kompetisies.

□Nooit □Selde □Soms □Dikwels □Altyd

12. Ek kan duidelik my toekomstige sportvertoning in my verbeelding visualiseer.

□Nooit □Selde □Soms □Dikwels □Altyd

13. As ek agter raak in 'n kompetisie, voel ek dat oorwinning onmoontlik is.

□Nooit □Selde □Soms □Dikwels □Altyd

14. Ek stel realistiese maar uitdagende mikpunte vir my sport.

□Nooit □Selde □Soms □Dikwels □Altyd

15. Hoe belangriker die kompetisie, hoe meer geniet ek dit.

□Nooit □Selde □Soms □Dikwels □Altyd

16. Voor belangrike kompetisies het ek die vertroue dat ek die druk kan hanteer.

□Nooit □Selde □Soms □Dikwels □Altyd

17. Ek het probleme om te konsentreer tydens belangrike kompetisies.

□Nooit □Selde □Soms □Dikwels □Altyd

18. Ek vind dit moeilik om 'n duidelike prentjie van my sport in my verbeelding te visualiseer.

□Nooit □Selde □Soms □Dikwels □Altyd

19. Ek kan vinnig herstel na 'n teleurstellende vertoning.

☐Nooit ☐Selde ☐Soms ☐Dikwels ☐Altyd

20. Ek skryf my mikpunte vir my sport neer.

☐Nooit ☐Selde ☐Soms ☐Dikwels ☐Altyd

21. Ek geniet die uitdagings van belangrike kompetisies.

☐Nooit ☐Selde ☐Soms ☐Dikwels ☐Altyd

22. Ek ervaar gedagtes van mislukking tydens belangrike kompetisies.

☐Nooit ☐Selde ☐Soms ☐Dikwels ☐Altyd

23. Wanneer onverwagte gebeure plaasvind tydens belangrike kompetisies ontwrig dit my konsentrasie.

☐Nooit ☐Selde ☐Soms ☐Dikwels ☐Altyd

24. Ek visualiseer my sport in my verbeelding tydens oefensessies.

☐Nooit ☐Selde ☐Soms ☐Dikwels ☐Altyd

25. Ek streef na beter prestasies.

☐Nooit ☐Selde ☐Soms ☐Dikwels ☐Altyd

26. Ek monitor my vordering op pad na my mikpunte.

☐Nooit ☐Selde ☐Soms ☐Dikwels ☐Altyd

27. Ek kan my senuagtigheid beheer tydens belangrike kompetisies.

☐Nooit ☐Selde ☐Soms ☐Dikwels ☐Altyd

28. Voor belangrike kompetisies is ek vol vertroue dat ek die uitdagings kan hanteer.

☐Nooit ☐Selde ☐Soms ☐Dikwels ☐Altyd

29. My konsentrasie laat my in die steek tydens belangrike kompetisies.

☐Nooit ☐Selde ☐Soms ☐Dikwels ☐Altyd

30. Ek visualiseer my sport in my verbeelding tydens kompetisies.

☐Nooit ☐Selde ☐Soms ☐Dikwels ☐Altyd

31. Ek slaag goed daarin om myself te motiveer.

☐Nooit ☐Selde ☐Soms ☐Dikwels ☐Altyd

32. Ek stel spesifieke mikpunte vir elke oefensessie.

☐Nooit ☐Selde ☐Soms ☐Dikwels ☐Altyd

33. Ek kan onverwagte stres tydens belangrike kompetisies beheer.

☐Nooit ☐Selde ☐Soms ☐Dikwels ☐Altyd

34. Ek twyfel oor my sportvermoë.

☐Nooit ☐Selde ☐Soms ☐Dikwels ☐Altyd

35. My gedagtes meng in met my prestasie tydens belangrike kompetisies.

☐Nooit ☐Selde ☐Soms ☐Dikwels ☐Altyd

36. Ek visualiseer my sport in my verbeelding net voordat 'n belangrike kompetisie begin.

☐Nooit ☐Selde ☐Soms ☐Dikwels ☐Altyd

37. Ek is gemotiveerd om te presteer in my sport.

☐Nooit ☐Selde ☐Soms ☐Dikwels ☐Altyd

38. Ek stel spesifieke mikpunte vir elke kompetisie.

☐Nooit ☐Selde ☐Soms ☐Dikwels ☐Altyd

39. Ek is bekommerd dat ek sal misluk tydens belangrike kompetisies.

☐Nooit ☐Selde ☐Soms ☐Dikwels ☐Altyd

40. My selfvertroue neig om te verswak namate 'n belangrike kompetisie nader kom.

☐Nooit ☐Selde ☐Soms ☐Dikwels ☐Altyd

41. Ek kan negatiewe gedagtes effektief blokkeer tydens belangrike kompetisies.

☐Nooit ☐Selde ☐Soms ☐Dikwels ☐Altyd

42. Ek visualiseer die hantering van terugslae of die hantering van moeilike situasies in my sport.

☐Nooit ☐Selde ☐Soms ☐Dikwels ☐Altyd

43. Ek sien uit na belangrike kompetisies.

☐Nooit ☐Selde ☐Soms ☐Dikwels ☐Altyd

44. My spesifieke mikpunte is so opgestel dat dit my lei na my uiteindelike langtermyndoel.

☐Nooit ☐Selde ☐Soms ☐Dikwels ☐Altyd

45. Ek weet hoe om myself te laat ontspan in moeilike situasies.

☐Nooit ☐Selde ☐Soms ☐Dikwels ☐Altyd

46. Wanneer ek begin om swak te presteer, verswak my selfvertroue vinnig.

☐Nooit ☐Selde ☐Soms ☐Dikwels ☐Altyd

47. Negatiewe opmerkings deur ander mense (bv. toeskouers of opponente) ontstel my tydens belangrike kompetisies.

☐Nooit ☐Selde ☐Soms ☐Dikwels ☐Altyd

48. Ek maak gebruik van visualisering in die periode net voor die begin van 'n kompetisie.

☐Nooit ☐Selde ☐Soms ☐Dikwels ☐Altyd

49. Ek is 'n taai mededinger .

☐Nooit ☐Selde ☐Soms ☐Dikwels ☐Altyd

50. Al my mikpunte het teikendatums.

☐Nooit ☐Selde ☐Soms ☐Dikwels ☐Altyd

51. Wanneer ek 'n fout tydens belangrike kompetisies maak, raak ek senuagtig.

☐Nooit ☐Selde ☐Soms ☐Dikwels ☐Altyd

52. Voor 'n belangrike kompetisie is ek bekommerd dat ek nie so goed sal wees as wat ek kan nie.

☐Nooit ☐Selde ☐Soms ☐Dikwels ☐Altyd

53. Ek kan vinnig my konsentrasie herfokus wanneer my aandag afgetrek word tydens belangrike kompetisies.

☐Nooit ☐Selde ☐Soms ☐Dikwels ☐Altyd

54. Wanneer ek my sport in my verbeelding oefen, probeer ek my verbeel hoe dit in my spiere sal voel.

☐Nooit ☐Selde ☐Soms ☐Dikwels ☐Altyd

55. Ek is entoesiasties by oefensessies.

☐Nooit ☐Selde ☐Soms ☐Dikwels ☐Altyd

56. Ek stel self my mikpunte vir my sport.

☐Nooit ☐Selde ☐Soms ☐Dikwels ☐Altyd

57. Ek is bekommerd dat ander mense teleurgesteld sal wees met my vertoning tydens belangrike kompetisies.

☐Nooit ☐Selde ☐Soms ☐Dikwels ☐Altyd

58. Voor belangrike kompetisies is ek vol vertroue dat ek goed sal presteer.

☐Nooit ☐Selde ☐Soms ☐Dikwels ☐Altyd

59. Wanneer 'n kompetisie nie so goed gaan nie word my konsentrasie maklik ontwrig.

☐Nooit ☐Selde ☐Soms ☐Dikwels ☐Altyd

60. Ek kan my vorige sportvertonings duidelik in my verbeelding visualiseer.

☐Nooit ☐Selde ☐Soms ☐Dikwels ☐Altyd

Dankie

Appendix D

Anonieme drie-item vraelys

1. Ek het hierdie inventaris beantwoord soos ek werklik en eerlik gevoel het.

□Ja □Nee

2. Ek het hierdie inventaris beantwoord soos ek gedink het dat my afrigter verwag het.

□Ja □Nee

3. Ek het hierdie inventaris beantwoord sodat dit die beste indruk van myself sou skep.

□Ja □Nee

Appendix E

Score Sheet

Psychological Skills Inventory

Name **Sport**

Scoring

Never = 0 *Rarely* = 1 *Sometimes* = 2 *Often* = 3 *Always* = 4

Items printed in bold (e.g. **3**, **9**, **10**) are scored in reverse order:

Never = 4 *Rarely* = 3 *Sometimes* = 2 *Often* = 1 *Always* = 0

The sum of the scores of each of the 6 dimensions is divided by the total possible score and expressed as a percentage.

Dimensions of psychological skills

Achievement motivation **/40 = %**

1 7 ***13*** 19 25 31 37 43 49 55

Goal setting **/40 = %**

2 8 14 20 26 32 38 44 50 56

Anxiety control **/40 = %**

3 ***9*** 15 21 27 33 ***39*** 45 ***51*** ***57***

Maintaining confidence **/40 = %**

4 ***10*** 16 ***22*** 28 ***34*** ***40*** ***46*** ***52*** 58

Concentration **/40 = %**

5 11 ***17*** ***23*** ***29*** ***35*** 41 ***47*** 53 ***59***

Mental Rehearsal **/40 = %**

6 12 ***18*** 24 30 36 42 48 54 60

Appendix F

Antwoordvel

Sielkundige Vaardighede Inventaris

Naam **Sport**

Tellings

Nooit = 0 *Selde* = 1 *Soms* = 2 *Dikwels* = 3 *Altyd* =4

Items in vetdruk (bv. **3**, **9**, **10**) word in omgekeerde orde gemerk:

Nooit = 4 *Selde* = 3 *Soms* = 2 *Dikwels* = 1 *Altyd* =0

Die som van die tellings in elk van die 6 dimensies word verdeel deur die totale moontlike telling en as persentasie uitgedruk.

Dimensies van Sielkundige Vaardighede

Prestasiemotivering /40 = %

1 7 ***13*** 19 25 31 37 43 49 55

Doelwitstelling /40 = %

2 8 14 20 26 32 38 44 50 56

Aktiveringsbeheer...../40 = %

3 ***9*** 15 21 27 33 ***39*** 45 ***51*** ***57***

Handhawing van selfvertroue /40 = %

4 ***10*** 16 ***22*** 28 ***34*** ***40*** ***46*** ***52*** 58

Konsentrasie /40 = %

5 11 ***17*** ***23*** ***29*** ***35*** 41 ***47*** 53 ***59***

Verstandelike Oefening /40 = %

6 12 ***18*** 24 30 36 42 48 54 60