Chapter 1

INTRODUCTION

1.1   BACKGROUND

This section aims to introduce the rationale for the study, by elucidating the need for exploration in this field.

Irrespective of the sport in question, an athlete's success or failure is dependent on a combination of physical and mental abilities (Nideffer, 1976). Even though athletes and coaches generally do acknowledge the importance of mental skills, they are rarely practised in a methodical manner. Usually, insufficient time is allocated for mental training because of the lack of knowledge in implementing a programme, or due to the myth that mental skills cannot be learnt. Everyone is born with specific physical and psychological strengths and weaknesses, but skills can be learned and developed. Being a champion requires that mental skills be systematically practised and integrated with physical abilities (Weinberg & Gould, 1999). A Psychological Skills Training (PST) programme provides an ideal opportunity for doing so.

However, sport psychology is a relatively new field in a country where a strong sport culture has evolved since South Africa's re-admission into the international competitive sport sphere (Grundlingh, 1997). Standards are now higher, competition is tougher, and the stakes too are much higher. Sponsors and development programmes have been instituted, and it appears as if "every movable limb has been activated" (Grundlingh, 1997, p.60). Incorporating specific psychological skills into play, is an essential mechanism for providing athletes with a performance edge over competitors. These specific psychological skills are

self-confidence, stress management, attention, motivation and mental imagery (Singer, 1992).

Potgieter (1992) cites Odendaal's (1991) paper on mental imagery in sport, which asserted that this field has generated very little research in South Africa, and hoped that more research would emanate in this country.

According to Gahwiler (in van Zyl, 1999) from the Institute of Sport Sciences, some athletes like South African cricketer Lance Klusener are naturally mentally strong, as exhibited by his consistent performance at the Cricket World Cup in 1999. He asserts that the majority of the other athletes have to practice stress management just as they practice physical skills. Van Velden, another Cape Town psychologist, commented on his observations during the Rapport Tour, that high stress levels were the cyclists' single biggest problem. The Springboks also used stress as an excuse for their embarrassing match against Wales in 1999 (van Zyl, 1999).

Although literature on PST programmes has been published only since the mid-1980's, sufficient evidence exists to support the conclusion that they are very effective and impact positively on performance in a large variety of sports (Wann, 1997). To elucidate how PST programmes have improved athletic performance in a number of different sports, Morris & Summers (1995) cite the following studies: basketball (Hughes, 1990; Kendall, Hrycaiko, Martin, & Kendall, 1990), football (Fenker & Lambiotte, 1987; Hughes, 1990), gymnastics (Cogan & Petrie, 1995), ice hockey (Anderson, Crowell, Doman, & Howard, 1988), cricket (Bull, 1995), skiing (Hellstedt, 1987), and field hockey (Bakker & Kayser, 1994). Furthermore, PST programmes have been used successfully with young (Li-Wei et al., 1992; Orlick & McCafery, 1991; Weiss, 1991), interscholastic (Anderson et al., 1988; Hellstedt, 1987; Hughes, 1990), intercollegiate (Daw & Burton, 1994; Fenker & Lambiotte, 1987;

Meyers & Schleser, 1980), elite (Gould   et al., 1990), physically challenged (Asken, 1991; Clark & Sachs, 1991), as well as with athletes from different cultures (Cox & Liu, 1993), (Morris and Summers (1995).

However, in none of these studies did the sample constitute South African athletes, and more specifically sprinters. Hence, the need for this research.

1.2   PROBLEM STATEMENT

There are two subproblems that the study aims to investigate. Firstly, are sprinter's psychological skills (specifically self-confidence, stress management, attention, motivation and mental imagery) enhanced after participation in a psychological skills training programme? Secondly, does an enhancement of psychological skills correlate with an improvement in athletic performance for sprinters?

1.3   OBJECTIVES OF THE STUDY

The objectives of this study are twofold. Firstly, the study aims to reveal an enhancement of psychological skills after participating in a psychological skills training programme, and secondly that sprinter's athletic performance improves upon enhancement of psychological skills.

1.4   BRIEF OVERVIEW OF THESIS

Proceeding this introduction, the thesis continues with the literature study in Chapter 2. The literature survey covers PST programmes, psychological skills and sprinting. This is followed by a concise discussion on the research methodology used in the present research project in

Chapter 3. Chapter 4 presents the research findings and an explanation thereof. The content section of the thesis concludes with a summary of a thesis and recommendations for future research in Chapter 5. The appendices include figures, tables, and a handbook for the athlete.

Chapter 2

LITERATURE STUDY

The literature study encompasses three broad fields: psychological skills training (PST) programmes, psychological skills and sprinting. PST programmes are categorised into programmes that provide a general structure and specific PST programmes. Several programmes in each category will be discussed. The definitions, theoretical views and enhancement techniques of five psychological skills will be presented. The five psychological skills are self-confidence, stress management, attention, motivation and mental imagery. The section on sprinting provides an explanation of what sprinting is, and sprinting procedures.

2.1   PSYCHOLOGICAL SKILLS TRAINING PROGRAMMES

This section first concentrates on the general structure of PST programmes. It analyses various structures proposed by theorists who have attempted to trace the **process** of psychological skills training, in terms of several distinct stages. The second part of this section examines specific PST programmes that are presented as "packages of skills" (Morris & Summers, 1995, p.216). These specific programmes essentially constitute the **content** of PST programmes.

2.1.1   GENERAL STRUCTURES

There are relatively few general structures of the process of psychological skills training. Morris and Summers (1995) suggest that the reason for this may be that this area has not developed sufficiently that general structures of the process may be proposed. However,

Morris and Summers (1995) cite structures proposed by Martens (1987), Vealey (1988), Boutcher and Rotella (1987) and Morris (1992), and Wann (1997) has also proposed a structure for PST programmes. These structures will be discussed and the use of Wann's structure will be rationalised. Criticisms of general structures of PST programmes are also presented.

Martens's (1987) programme's structure has three phases. Martens (1987) advises first explaining to the athletes how different psychological skills impact on performance. The psychological skills training occurs in the acquisition phase. The final phase requires the athletes to practice the skills and integrate them into their performance routines. Although Martens's structure is a general structure of how the programme should proceed, in 1989 Bump, as cited in Morris and Summers (1995) developed an accompanying study guide and workbook that describes the actual content of the programme (Morris & Summers, 1995). Martens's structure has been rejected for the present study as it lacks any form of assessment.

Vealey's (1988) structure as cited in Morris and Summers (1995) also proposes three phases. The attainment phase is essentially a combination of Martens's education and acquisition phase. In the sustainment phase is when the athlete must integrate the skills into practice and competition. Her structure differs from Martens' as she adds a coping phase. In this phase the athlete develops strategies to cope with situations when skills aren't entirely effective. Vealey's model has been criticised as being too general, and not providing any insight at all on how to do the psychological skills training (Morris & Summers, 1995).

Morris and Summers (1995) also highlight Boutcher and Rotella's (1987) structure of a programme, which evolved with the aim of enhancing closed skills, even though they contend that most of the programme enhances open skills too. Their programme consists of four

phases. The sport analysis phase requires examining the psychological skills required for the sport in question. This is followed by an assessment phase where the athlete's strengths and weaknesses are determined and profiled. In the conceptualisation phase, goals are set and the athlete's commitment is ensured. The final phase concentrates on the development of the skills identified in the conceptualisation phase, applying the skills to performance and using them in competition. Although Boutcher and Rotella advocate an educational perspective, their structure appears to be more problem-oriented (Morris & Summers, 1995).

Morris (1992) in Morris and Summers (1995) proposes a five-stage structure commencing with assessment. The second stage is the basic skills training. Morris emphasises the importance of feedback of the assessment in this stage. Morris presents routine development and routine application as separate stages. The final evaluation stage refers to continuously monitoring the effectiveness of the athlete's routines and making adjustments where necessary (Morris & Summers, 1995). This structure lacks an introductory education phase.

Wann's (1997) Comprehensive Intervention Programme for Athletes constitutes five stages. In the first stage, the athletes are educated about the importance of the programme. Since many athletes are unaware of exactly how psychological skills can better their performance, this phase allows them to acknowledge just how important it is to become psychologically proficient too. The second stage is the Assessment phase wherein psychological skills and athletic performance are evaluated. In the present study, psychological skills were assessed by psychometric tests and questionnaires measuring self-confidence, state, and trait anxiety, vividness of mental imagery, motivation, and attentional style, as the PST programme attempts to enhance these skills. Performance records are used to assess athletic performance. The Acquisition stage is psychological skills training per se. Here, Winter and Martin's (1993) programme will be used. The reason why this specific programme is selected

will be discussed in the following section. In the practice stage the athletes are given a period to learn the skills and systematically integrate them into their performance situations, as well as simulate the skills that need to be applied in actual competition. It may take several months up to a year to fully understand new psychological skills, and integrate them into the actual competition situation. The actual time required for practising skills varies according to what is being learnt and how well it is learnt (Weinberg & Gould, 1999). The last stage is the final assessment stage. The same assessments used in stage 2 are re-administered (Wann, 1997).

Table 1

Overview of General Structures

	Martens (1987)	Vealey (1988)	Boutcher & Rotella (1987)	Morris (1992)	Wann (1997)
Evaluating which skills are required			✔		
Education	✔	✔			✔
Assessment			✔	✔	✔
Acquisition	✔	✔	✔	✔	✔
Practice	✔	✔	✔	✔	✔
Coping		✔			
Continuous evaluation				✔	
Post-assessment					✔

As gleaned from Table 1, none of the general structures embrace all the components. However, Wann's (1997) general structure of a psychological skills training programme is going to be used to construct a framework for the current research project. The inclusion of a final assessment stage makes this an ideal model for research purposes, as the first assessments serve as a pre-test and the final evaluations serve as a posttest. Even though this structure lacks a continuous evaluation phase, the practice phase is long enough to allow necessary modifications to be recognised and implemented. Wann's structure also lacks an evaluation of psychological skills relevant to the sport. Winter and Martin's programme that will be used in the acquisition phase explicitly states that the psychological skills focused on in their programme are relevant to "athletes in all types of sports" (Winter & Martin, 1993, p.1). Hence the absence of this component is presently not an issue. What is still a shortcoming of this structure, is that it does not include a backup coping plan for times when the psychological skills prescribed are not sufficient.

One of the criticisms of general structures is that not all athletes are adequately assessed by the formal assessments in the beginning phase of the programme. Slow progress may be a problem even with a general programme. If the initial phases are drawn out, there may be too little time to actually practice the psychological skills. Or, if there isn't immediate progress after practising the skills the athlete may get demotivated. Another problem with general structures is common logistical pitfalls, for example getting sufficient quality time to work with the athletes, and co-operation from the coach. The strongest criticism against general structures is that they are too rigid. They are not always relevant to all athletes in all circumstances and may therefore be ineffective if religiously adhered to. A general structure should provide enough guidelines to support a novice sport psychology practitioner, yet it should be flexible and adaptive enough for each specific situation (Morris & Summers, 1995).

2.1.2   EXISTING PSYCHOLOGICAL SKILLS TRAINING PROGRAMMES

Existing psychological skills training (PST) programmes constitute the acquisition and practice stage of the general structure. PST programmes are detailed intervention programmes that aim to educate and train athletes in mental preparation for sport. The goal of these training exercises is to develop new mental skills to enhance performance, not necessarily to overcome problems (Morris & Summers, 1995).

Numerous PST programmes already exist. Suinn's Seven Steps to Peak Performance (1986), and Martens's (1987) American Coaching Effectiveness Program will be elaborated upon. Rushall's (1992) Programme and Hardy and Fazey's (1990) programme for the National Coaching Foundation in Britain cited by Morris and Summers (1995), as well as Winter and Martin's Programme for the South Australian Sports Institute will also be briefly discussed.

The core methods and techniques of PST programmes developed in a somewhat ad hoc manner, responding to the pressing needs of the performance enhancement practitioners (Weinberg & Gould, 1999). Consequently, several common characteristics of PST programmes became discernible. Although present programmes contain these core characteristics, they do not all have precisely the same components, as programmes are adjusted to meet the specific needs of the individual athlete, team or sport (Weinberg & Gould, 1999).

Several PST programmes have been developed in North America. Suinn's Seven Steps to Peak Performance (1986) was one of the first training manuals for athletes. The first step is relaxation training. Progressive muscle relaxation is followed by instruction in centering which is then implemented in practice and competitions. Stress Management entails

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recognising stress and using centering to control it. The third step is positive thought control techniques where negative thoughts are replace positive affirmation statements. Personal best performances are reviewed in Step four in order to develop self-regulation skills. The next step is Visuo Motor Behavioural Rehearsal (VMBR) training. In the sixth step the athlete learns to control and direct attention, and refocus after distractions. The last step trains the athlete to recognise his own energy and control it for optimal use (Suinn, 1986).

Martens's (1987) American Coaching Effectiveness Program provides training materials in six primary areas that are the same as Suinn's (1986), except for the inclusion of positive thought control techniques. Martens provides a consistent explanation or research in these six fields. In 1989, Bump (cited in Morris and Summers, 1995) published an accompanying study guide and workbook that presents questions and exercises that serve as helpful resource materials (Morris & Summers, 1995).

Rushall's (1992) programme discussed in Morris and Summers (1995) attempts to alter mental behaviour within a behaviourist framework. Training is aimed at encouraging a positive approach to the sporting experience, goal setting, developing commitment, imagery, relaxation skills, pre-competition and competition skills and team building. The procedures include overt and covert positive reinforcement, maintaining progressive behaviour records, self-control behaviours, and utilising discriminative and instructional stimuli (Morris & Summers, 1995).

Morris and Summers (1995) also mention Hardy and Fazey (1990) who developed a programme for the National Coaching Foundation in Britain. Their programme consists of four cassettes and accompanying booklets, and covers goal setting, relaxation training, mental rehearsal and concentration (Morris & Summers, 1995).

Table 2

Overview of Existing PST Programmes

	Suinn (1986)	Martens (1987)	Rushall (1992)	Hardy & Fazey (1990)	Winter & Martins (1991)
Stress Management	✔	✔	✔	✔	✔
Self-confidence	✔	✔			✔
Mental Imagery	✔	✔	✔	✔	✔
Attentional Training	✔	✔		✔	✔
Motivation			✔	✔	✔

Winter and Martin's (1993) programme will be used in the present research project. This programme lasts approximately five to ten weeks and consists of seven modules presented to athletes through a workbook and audio cassettes (Morris & Summers, 1995).

The first module in the programme is goal setting. Short- and long-term goals in sport are identified and time frames for achieving them are set. The sport psychology consultant, athlete and coach determine the activities required to accomplish the goals, and set up a training diary. Self-motivation is presented as a separate model, but it incorporates goal setting and goal visualisation. The next module trains the athlete in progressive muscular relaxation techniques. To improve concentration in the proceeding module, the athlete learns

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focusing skills, how to be mentally prepared for competition and simulates competition situations during practice. The athlete also establishes pre-competition routines. Centering is learnt as well as segmenting competition and focusing on the present. The self-confidence module requires athletes to identify and record strengths in attitudes and mental approach, technical skills and knowledge and physical fitness, recognise negative thinking and use affirmations to change thoughts and feelings and develop confidence. The visualisation module trains the athlete to plan what he wants to see, hear and feel in training and competition situations, visualise the situations, record vividness of imagery experiences and determine what needs to be improved in future sessions. In the final module relaxation skills, visualisation and planning are combined to establish a mind-set that facilitates optimal performance in competition. The athletes reflect on previously successful performances, identify the effective pre-competition routines, relaxation techniques, mentally rehearsing important aspects of performance in the competition environment and establish a set of performance cues (Morris & Summers, 1995).

At this point it is important to consider Vealey's distinction between psychological skills and psychological methods. Psychological skills are the desired outcomes (viz. Increased self-confidence, reduced anxiety) associated with the implementation of psychological methods. For example, Suinn's first two steps are progressive muscular relaxation and centering. These are two psychological methods but they both aim to enhance the same psychological skill, i.e. stress management. Hence although there are seven psychological methods employed, only four skills are targeted (Hardy, Jones & Gould, 1996).

According to Vealey four methods are prominently mentioned in sport psychology literature: imagery, thought control, physical relaxation and goal setting (Hardy, et al, 1996). After examining all the models, it appears that there are five skills that are being enhanced. Judging from Table 2, only one programme aims to enhance all five skills, and that is Winter

and Martin's (1993) programme. Hence, their programme will be used in the acquisition and practice phase of the present study.

Existing PST programmes have been criticised on several grounds. Firstly, although several skills are taught, the athletes are not shown how to use them in competition situations. Secondly, the same techniques are used continuously without questioning the empirical principles underlying them. Thirdly, the manner of delivery chosen is usually the most convenient one rather than the most effective one. This is especially true regarding timing of formal programmes (Morris & Summers, 1995).

2.2 PSYCHOLOGICAL SKILLS

The present research project attempts to enhance five psychological skills identified as the critical skills in the previous section, viz. self-confidence, stress management, attention, motivation and mental imagery. The following sections elucidate what these concepts mean within the context of sport psychology, the different theories underlying each concept, and the various strategies of developing these skills.

2.2.1 SELF CONFIDENCE

"The whole thing is never to get negative about yourself. Sure, it's possible that the other guy you're playing is tough, and that he may have beaten you the last time you played, and okay, maybe you haven't been playing all that well yourself. But the minute you start thinking about these things you're dead. I go out to every match convinced that I'm going to win. That's all there is to it" (Jimmy Connors, in Weinberg & Gould, 1995, p.299).

This section commences with the definition of self-confidence within the sporting context. The advantages of including self-confidence in a PST programmes are highlighted using previous research cases. The different types of confidence are discussed, as well as how self-confidence impacts on athletic performance. Two theoretical views of self-confidence will be explained. This section concludes with the methods used in sport psychology to improve self-confidence.

2.2.1.1 What is self-confidence?

Besides a general definition of self-confidence within the sport psychology context, it is also important to understand what task-confidence implies.

According to sport psychologists, self-confidence is "the belief that you have the ability to achieve the goals that you want to achieve" (Winter & Martin, 1993, p.28). Within the sporting context, self-confidence basically means to expect to win. Athletes lacking self-confidence doubt whether their abilities are good enough (Weinberg & Gould, 1995, p.300).

Task confidence prevails when athletes are particularly confident about particular aspects of their athletic performance in which they have certain expertise and are especially proficient (Winter & Martin, 1993).

Self-confidence has been selected as a skill that should be enhanced in a PST programme, as numerous studies have indicated a positive relationship between self-confidence and performance. Hardy et al. (1996) cite Mahoney and Avener's (1977) study with American Olympic gymnasts which concluded that self-confident gymnasts were more likely to qualify for the team. Hardy et al. (1996) also cites a later study by Mahoney et al. (1987) which found that elite performers had higher and more stable levels of self-confidence than non-

elite athletes. Subsequent analyses also revealed that self-confidence was a significant differentiating factor between elite and non-elite athletes. Hardy et al. cites Gould et al. (1981), Highlen and Bennet (1979), and Meyers et al. (1979) who found self-confidence to be an important distinguishing factor between successful and less successful wrestlers. In 1980, Doyle et al. and in 1994, Jones et al. (both cited in Morris and Summers, 1995) also reached the same conclusion with international rifle shooters and with swimmers respectively. However, these studies were all correlational, hence causality cannot be inferred (Hardy et al., 1996).

Several studies attempt to demonstrate the relationship between self-confidence (the expectation to win) and performance. Weinberg and Gould (1999) cite studies by Nelson & Furst (1972), Ness and Paton (1979) and Mahoney and Avener (1977). Nelson and Furst showed with arm wrestlers that the important factor in success was not physical strength, but who the contestants expected to win. Ness and Paton's study concluded that when weightlifters believed and expected, they could lift a weight more than they thought they were lifting. Research with the 1976 Men's Olympic gymnastics team by Mahoney and Avener, found that the gymnasts with self-doubts performed worse than those who expressed none. The gymnasts who exhibited the highest expectations of success, also performed the best (Weinberg & Gould, 1999).

When athletes are uncertain about their ability to succeed or expect something to go wrong, they are creating 'self-fulfilling prophecies'. This phenomenon means that if one expects something to happen, that person actually causes it to happen, irrespective of whether it's positive or negative. This inevitably leads to a vicious cycle (see Figure 1, Appendix A).

Within the sporting context, there are numerous benefits of confidence. Confidence leads to positive emotions like being more able to remain calm and relaxed when under pressure.

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This emotional state allows an athlete to be more aggressive in the competition situation. Self-confidence also increases effort. The intensity of an athlete's effort, and the time she spends pursuing that goal is to a large extent dependent on confidence. When athletes of equal ability are competing, the winners are those who believe in themselves, especially in a sport like running where persistence is imperative. Lastly, confidence impacts on the game strategy. Athletes "play to win" or at the other end of the continuum, "play not to lose". These two produce very different styles of playing. A confident athlete plays to win, is not afraid of risks and utilises the situation to his advantage, whereas when an athlete is not confident, he plays not to lose, is tentative, and tries to avoid doing something wrong and messing up rather than proactively trying to make something positive happen (Weinberg & Gould, 1999).

There are three main types of confidence - optimal confidence, diffidence and overconfidence (Martens, 1987).

The form of an inverted-U illustrates the relationship between confidence and performance. Performance improves as one becomes more confident, up to an optimal point, whereafter any more increase in confidence causes performance to deteriorate (Weinberg & Gould, 1999). It deteriorates because overconfidence misleads athletes into thinking they are so good that they do need to prepare as much, nor exert as much effort as needed (Martens, 1987).
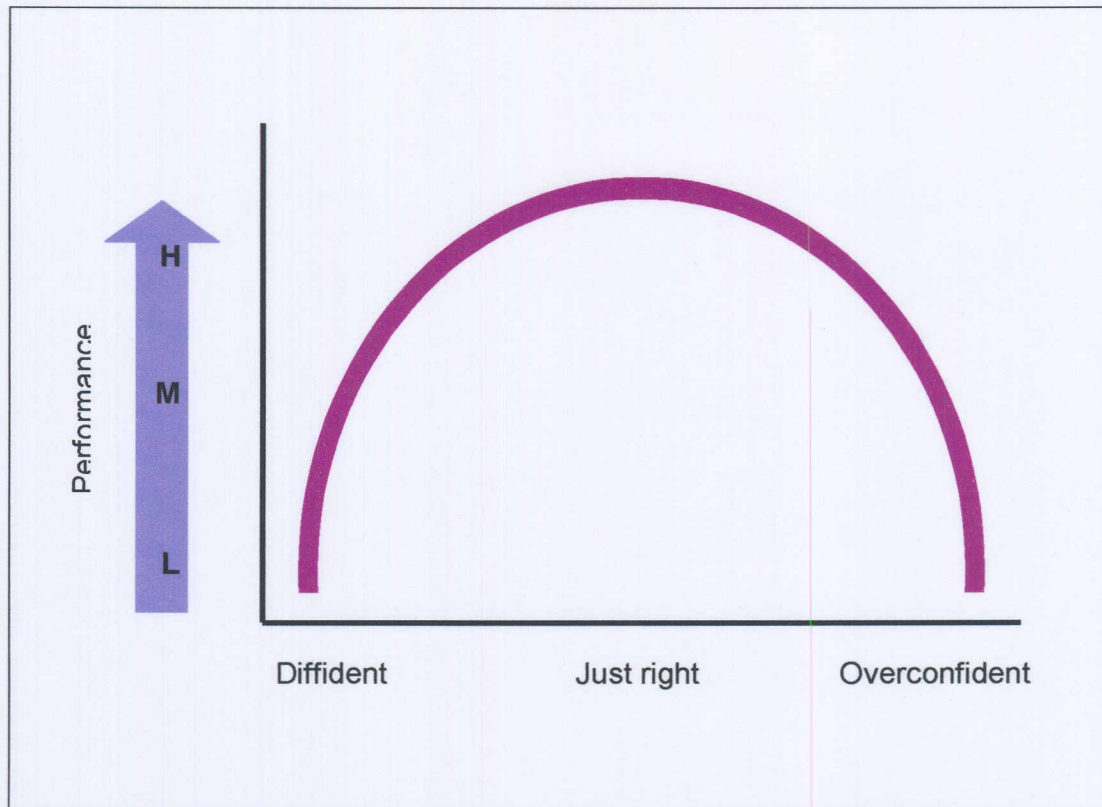
Figure 2. Optimal confidence.

The figure shows a graph with Performance on the y-axis (with H, M, L labels in an upward arrow) and x-axis labeled Diffident, Just right, Overconfident, with an inverted-U curve.

Athletes with optimal self-confidence set realistic goals. Some athletes believe that self-confidence ensures good performance. Although self-confidence does not guarantee success, it equips an athlete to deal better with failure. When an athlete's self-worth is not in question, the athlete feels more free to deal with errors (Martens, 1987).

Diffident athletes have too little confidence. They fear failure so much that they are easily humiliated and behave with apprehension. Because they see themselves as losers they become losers (Martens, 1987).

"A person who doubts himself is like a man who would enlist in the ranks of his enemies and bear arms against himself, He makes his failure certain by himself being the first person to be convinced of it" *(Dumas, in Martens, 1987, p.152).*

Overconfident athletes are those who are falsely confident. Their confidence is excessively disproportionate to their abilities. Overconfidence comprises two groups: firstly, those athletes who truly believe they are better than they really are, then there are those who appear confident, but are actually diffident. Confidence does not overcome incompetence. Hence, these athletes' performance actually declines because they believe they don't have to work very hard to succeed. Generally, overconfidence is not as prevalent as underconfidence, but the results are equally disastrous (Weinberg & Gould, 1999).

The questionnaire used in the present study measures diffidence, confidence and overconfidence. However, only the confidence score will be used.

2.2.1.2   Theories of self-confidence

Weinberg and Gould (1999) cite Bandura's (1977) self-efficacy theory which has emerged as the leading theory to explain the relationship between self-confidence and athletic performance.   Vealey's (1986) sport confidence model also attempts to explain this relationship. These two theories of self-confidence are discussed in more detail below.

Bandura defined self-efficacy as a form of self-confidence, where one perceives he has the ability to perform a task successfully (Weinberg & Gould, 1999). According to Bandura's self-efficacy theory, performance accomplishments, vicarious experience, verbal persuasion and emotional arousal enhance self-efficacy (Morris & Summers, 1995), (see Figure 3, Appendix A).

Bandura suggested that a reciprocal relationship exist between performance accomplishments and self-confidence (Morris & Summers, 1995). Very often an athlete has to perform a skill that has never been performed before. In such cases coaches often use vicarious experiences/modelling to help the athletes learn a new skill. By observing others doing the skill technically, the athletes gain confidence that they too can do it. Although modelling is not as effective as one's own mastery experiences, Weinberg and Gould (1999) cite evidence by Gould & Weiss (1981), McCauley (1985) and Weinberg, Gould and Jackson (1979) that indicates that it has a demonstrated effectiveness (Weinberg & Gould, 1999). Coaches and teammates often use verbal persuasion to convince athletes that they are capable of accomplishing a certain feat. Verbal persuasion is more effective if the person trying to persuade is seen as trustworthy, and is qualified to make the judgement. The task to be accomplished must also be realistic (Morris & Summers, 1995). Emotional arousal may also impact on self-confidence. Bandura proposed that when an athlete senses an increase in physiological arousal, behaviour changes because of the change in efficacy perceptions. If

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the arousal is interpreted as a sign of anxiety, this may create self-doubts, whereas if it is perceived as an indication that the body is geared up to perform optimally, self-efficacy is actually enhanced (Morris & Summers, 1995).

According to Vealey's (1986) sport confidence model, self-confidence consists of two constructs, viz. trait self-confidence and state self-confidence. Another important construct is competitive orientation, which implies that different athletes define success differently. Vealey proposes that trait self-confidence and competitive orientation interact with the objective sport situation to produce the self-confidence state, which is the most critical mediator of behaviour (Hardy et al., 1996).
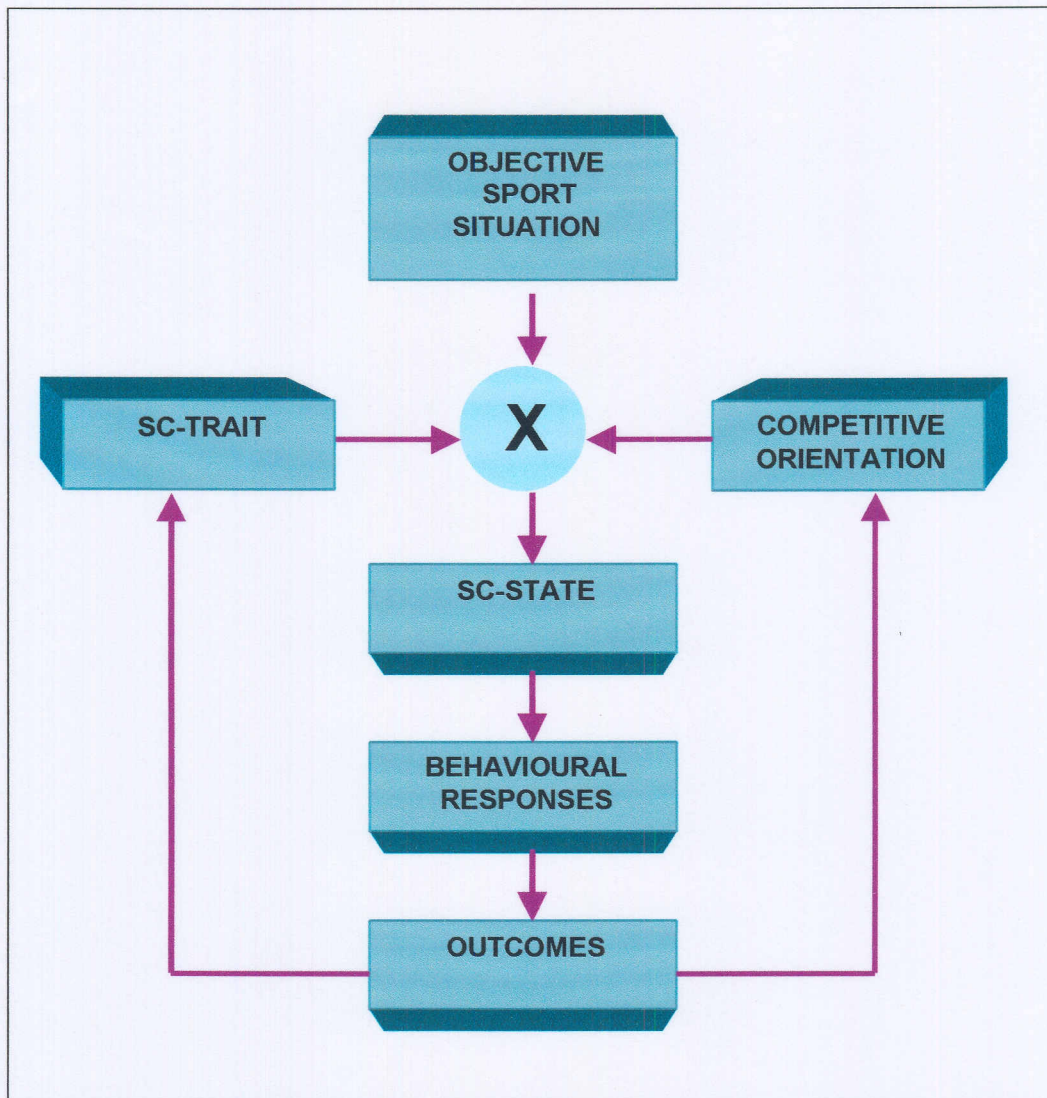
Figure 4. Vealey's (1986) sport confidence model.

Relatively little research confirms this model, but Hardy et al. (1996) cite Martin and Gill (1991) who provide partial support even though they did not find a significant relationship between state self-confidence and competitive orientation.

2.2.1.3   Building self-confidence

Using several behavioural and cognitive strategies can enhance self-confidence. Behavioural methods include performance accomplishments, practice, competitive simulations, acting confidently, preparation, and routines.   The most important cognitive strategy to build self-confidence is to consistently have constructive thoughts.   These methods will be briefly discussed, elaborating on the methods employed in Winter and Martin's (1993) programme.

The most effective behavioural strategy of enhancing self-confidence is through performance accomplishments, that is an athlete's own experience of success.   However, the situation becomes problematic when an athlete has had a series of losses.   Self-confidence is critical to success, but also tends to allude an athlete who is constantly being defeated.   Hence, it becomes a catch-22 situation.   Practice then becomes extremely important.   If a skill can be executed consistently during practice, one is more likely to feel confident within competitive situations (Weinberg & Gould, 1999).

Acting confidently can also help to build confidence. Since thoughts, emotions, and actions are interrelated, the more an athlete acts confidently, the more likely she is to feel confident. This is an important point to remember when you start to lose confidence, because then your opponent senses it and gains confidence.   Putting on a confident image during competition, more especially after mistakes or defeats is essential.   Avoid letting your body language give away signs of not being confident (Weinberg & Gould, 1999).

Competitive simulation requires the athlete to reproduce in training the circumstances, skills, and programs required in competition. This enhances both consistency of performance and consistency of self-belief when going into the competition (Orlick, 1986).

Preparation is an extremely important way to feel more self-confident (Weinberg & Gould, 1995).

> *"As long as I'm prepared, I always expect to win."* (Jack Nicklaus, in Weinberg & Gould, 1995, p.199).

An athlete can't expect to win if not prepared. Being prepared gives an athlete the knowledge that he knows he has done all he can to expect victory. An athlete should always have a strategy that takes into account how he is going to accomplish what he wants, alternative strategies, and considers opponent's abilities too (Weinberg & Gould, 1999). Winter and Martin (1993) strongly state in their programme that nothing can replace a sound, well-planned preparation spread over months.

A set precompetition routine is also indispensable. Knowing the order precisely builds confidence that extends to the competition itself (Weinberg & Gould, 1999). Although routines fall under the attention module in Winter and Martin's (1993) programme, the routines also impact on self-confidence.

Thinking positively is the crux of cognitive techniques to strengthen self-confidence. To maintain consistent results one needs to have consistently constructive thoughts and focuses when going into a competition. If the basic event is the same, and your prevent physical

preparation, convictions and competition focus is the same, then your performance, theoretically, ought to be consistent (Orlick, 1986). Thinking confidently enhances self-confidence. Athlete must think that they can and will achieve their goals. Negative and judgmental thoughts must be eliminated and replaced with positive, instructional and motivational thoughts (Weinberg & Gould, 1999). Winter and Martin (1993) use positive affirmations to boost self-confidence in their programme. Affirmations are positive statements that must be continuously repeated. The assist athletes in being more positive and constructive with their thoughts, feelings and reactions. The athletes first identify situations towards which they have negative attitudes, and try to change the attitudes with affirmations.

2.2.2   STRESS MANAGEMENT

Most athletes experience at least some anxiety during competition, but the ability to manage that anxiety, as well as use it to their advantage differentiates elite from non-elite athletes. The literature on peak performance also identifies being relaxed during performance as one feature of peak performance (Hardy et al., 1996). For this reason, stress management techniques has been selected as a component to be included in the training programme. To gain a clearer idea of stress management, this section first focuses on the definition of stress and related concepts, the stress process and the causes of stress. The different theoretical views of how arousal and anxiety influence athletic performance are discussed. The section concludes with a discussion on the actual stress management techniques.

2.2.2.1   What are stress, arousal and anxiety?

To manage stress effectively, one needs to first understand what it entails. This section aims to define stress and arousal. Anxiety is a multifaceted concept that is firstly divided into

somatic and cognitive anxiety and secondly, into state and trait anxiety.

Stress is a notable imbalance between demands and response capability, in situations where failing to meet that demand has important repercussions (Weinberg & Gould, 1999). It is a process, a series of events that leads to a particular end. McGrath propose a model that conceptualises stress as constituting four interrelated stages, specifically environmental demands, perceptions, responses and behaviours (Weinberg & Gould, 1999).
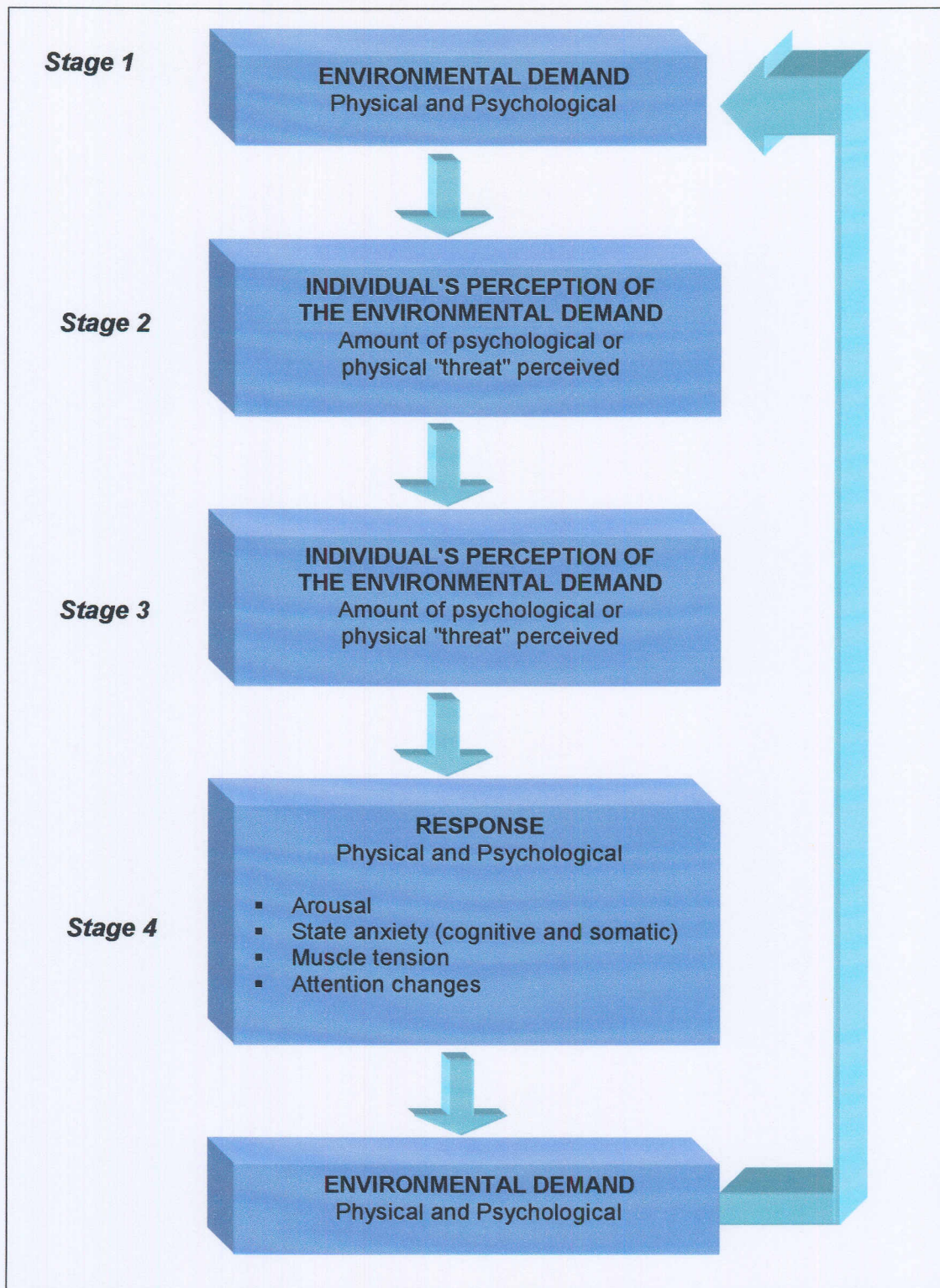
Figure 5. Stress process.

From *Foundations of Sport and exercise psychology* (p. 97) by R.S. Weinberg and D. Gould, 1995, Champaign: Human Kinetics. Copyright 1995 by R.S. Weinberg and D. Gould.

Gould and Krane (in Weinberg & Gould, 1995, p.92) define arousal as "a general physiological and psychological activation of the person that varies on a continuum from deep sleep to intense excitement. " A highly aroused person is mentally activated and will experience an elevated heart rate, respiration and sweating. Arousal is not automatically associated with either pleasant or unfavourable events. Both types of events may increase arousal significantly (Weinberg & Gould, 1995).

Morris & Summers (1995, p.30) cite Anshel, Freedson, Hamill, Haywood, Horvat and Plowman's (1992) definition of anxiety provided by the *Dictionary of the Sport and Exercise Sciences* which defines anxiety as a "subjective feeling of apprehension or perceived threat, sometimes accompanied by heightened physiological arousal". This indicates two components: firstly, a cognitive process and secondly, a somatic response Morris et al. (in Hardy et al., 1996, p.17) defined cognitive anxiety as "the cognitive elements of anxiety, such a negative expectations and cognitive concerns about oneself, the situation at hand and potential consequences". Somatic anxiety is "once perception all the physiological bearish of factors elements of the anxiety experience, that is, indications of Autonomic arousal and unpleasant feeling states such as nervousness and tension. Certain types of relaxation technique seem to work better for particular types of anxiety. Hence there are relaxation technique should be matched were there are types of anxiety experienced, cognitive anxiety might be treated were carved mental relaxation technique and somatic anxiety must be addressed words are physical relaxation technique (Hardy et al., 1996).

Another important distinction should be made between state and trait anxiety. State anxiety is the fluctuating element of anxiety. It is an emotional state that is distinguished by subjective, consciously perceived feelings of uneasiness and tension, and linked with arousal of the autonomic nervous system. Trait anxiety, on the contrary is part of one's personality. It is an acquired behavioural disposition that affects behaviour. Research consistently indicates that

there is a direct relationship between trait and state anxiety. However a person who is strongly trait anxious may have gained enough experience in a specific threatening situation, and does not perceive that situation as a threat anymore and does not experience the corresponding state anxiety. Likewise, trait anxious athletes may have learned coping skills to deal with the state anxiety in competition (Weinberg & Gould, 1999).

The present project aims to measure trait anxiety, somatic state anxiety and cognitive state anxiety.

2.2.2.2 *Theoretical views*

Sport psychology literature has no shortage of literature on stress theories. Spence and Spence's drive theory, the inverted-U hypothesis, Yuri Hanin's zone of optimal functioning theory, multidimensional anxiety theory, Hardy's catastrophe model and reversal theory will be elaborated upon.

Initially psychologists saw the relationship between arousal and performance as direct and linear. Morris and Summers (1995) discuss Spence and Spence's (1966) drive theory which postulates that when one's arousal or state anxiety increases so does his performance. But many athletes found that their performance deteriorated when they were overly aroused or too anxious. Hence, little scholarly verification exists for the drive theory (Weinberg & Gould, 1999). Later research also indicated that this theory was valid for performing easy motor tasks, but not for more difficult motor tasks (Morris & Summers, 1995).

According to the inverted-U hypothesis an increase in arousal will be associated with an increase in performance up to a certain point. This point is the optimal level of arousal. Any increase in arousal thereafter will lead to a decline in performance (Weinberg & Gould, 1999).

Although most athletes, coaches and sport psychologists accept this hypothesis, it has been recently criticised. The shape of the curve has been questioned, whether optimal arousal is always at the midpoint of the arousal continuum, and the nature of arousal itself (Weinberg & Gould, 1999).

One of the goals of the present programme is to assist the athletes to develop an ability to recognise when their own arousal levels are too low or too high and to learn how to get it into the optimum area (Winter & Martin, 1993).

Weinberg and Gould (1999) discuss Yuri Hanin's (1986) zone of optimal functioning (ZOF) theory, which proposed that top athletes each have a zone of optimal state anxiety wherein best performance occurs. Where this zone lies varies in different athletes. This theory differs from the inverted-U hypothesis in two ways. Firstly, the optimal level of anxiety is not necessarily at the midpoint of the anxiety continuum, but fluctuates amongst different individuals. Secondly the optimal level of state anxiety is not a single point but a bandwidth. Coaches should assist athletes to identify and reach their own particular zone of state anxiety (Weinberg & Gould, 1999).

The ZOF theory failed to examine whether the cognitive and somatic components of anxiety influence athletic performance differently. These state anxiety components are generally acknowledged to affect performance differently (Weinberg & Gould, 1999).

According to the multidimensional anxiety theory, cognitive state anxiety (worry) is negatively related to performance. An increase in cognitive state anxiety leads to decreases in performance. However somatic state anxiety follows an inverted-U pattern. Hence state anxiety is multidimensional with the two components having different effects on performance. Overall, research has indicated that the two anxiety components differentially predict

performance, but the exact predictions of multidimensional anxiety theory have not been constantly supported (Weinberg & Gould, 1999).

Weinberg and Gould (1999) also discuss Hardy's (1990) theory which addresses the relationship between arousal and cognitive anxiety. Hardy's catastrophe model predicts that physiological arousal is related to performance in an inverted-U pattern, but only if the athlete has low cognitive state anxiety. If cognitive anxiety is high, the increase in arousal at some point reaches a threshold just beyond the point of optimal arousal level and thereafter the athlete experiences a rapid decline in performance, i.e. a catastrophe occurs. Hence, arousal may have strikingly different effects, depending on the level of cognitive anxiety. To regain the optimal level of functioning, the athlete has to completely relax again. This theory has received good scientific support (Weinberg & Gould, 1999).
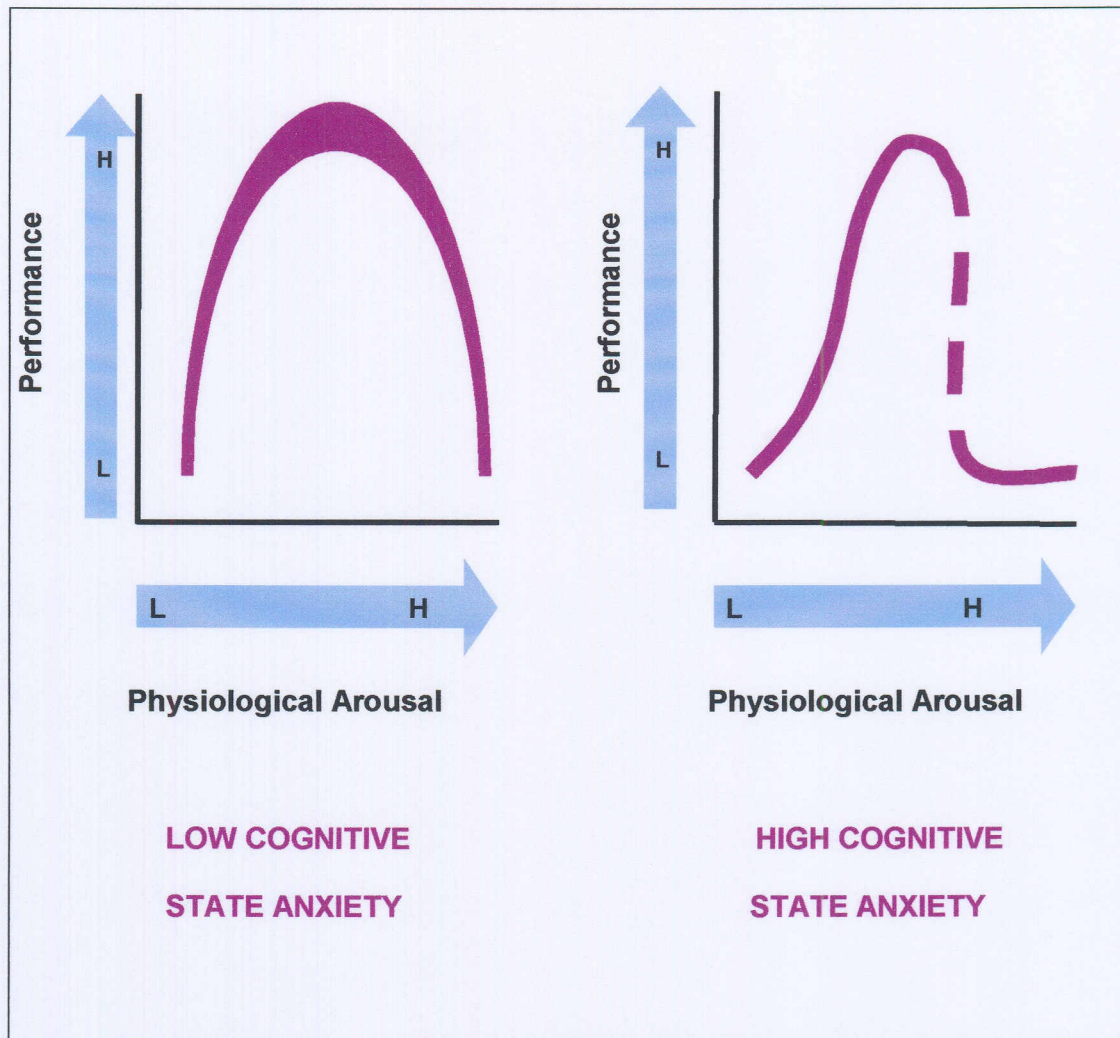
Performance

H

L

Physiological Arousal

L   H

LOW COGNITIVE

STATE ANXIETY

Performance

H

L

Physiological Arousal

L   H

HIGH COGNITIVE

STATE ANXIETY

Figure 7. Catastrophe model.

Weinberg and Gould (1999) discuss Kerr's (1985) reversal theory which asserts that the manner in which arousal impacts on performance depends on how the athlete interprets the arousal level. If arousal is interpreted positively, performance will be positively affected, and if arousal is interpreted negatively, performance in influenced negatively (Weinberg & Gould, 1999).

2.2.2.3   *Stress management techniques*

This section elaborates on several relaxation and stress management techniques, particularly progressive muscular relaxation, autogenic training, the use of other psychological skills and routines to reduce anxiety, stress inoculation training as well as some general guidelines for managing anxiety.

Progressive muscular relaxation (PMR) entails the systematic focus of attention on several groups muscle groups throughout the body. The athlete progresses through the body tensing and then releasing the tension from each muscle group in turn. This basic procedure has been adjusted in many ways, including differential PMR that involves partial relaxation of the muscles . This brings about a greater self-awareness of degrees of bodily tension and their implications for sporting performance. Ost's applied relaxation technique has not received much attention in the sport psychology context (Hardy et al., 1996). Almost every PST programme uses this relaxation technique, Winter and Martin's programme being no exception. Hence, this technique forms a central part of relaxation training in the present programme.

Hardy et al. cite Nideffer and Dechner's (1970) and Kukla's (1976) studies. Nideffer and Dechner have reported a case study where progressive relaxation was used to improve a shot putter's performance. Using a group design, Kukla executed progressive relaxation with

high school baseball plays a, and found a reduction in state anxiety and improved batting performance under stressful conditions in comparison to the control group, as well as improved serving performance. Although research has generally shown a decrease in state anxiety, the results relating to performance do not always show improvements and tend to be inconsistent (Hardy et al., 1996).

Autogenic training is a type of self-hypnosis where the athlete learns to create several physical concomitants of the hypnotic state. These include heavy and warm limbs, rhythmical breathing and heartbeat, a warm solar plexus and a cool forehead. A passive attitude is imperative (Morris & Summers, 1995).

Psychological skills like imagery, attentional control training and thought stopping (dealt with in other sections) also qualify as relaxation techniques (Morris & Summers, 1995).

Several relaxation and cognitive techniques can be included into competition routines to help the athlete control performance-related stress. The purpose of this plan is to reduce the detail on which the athlete must focus. The plan can take note of key segments, task and mood relevant cues and words, stress control routines, word/action to control actions and thoughts, a brief stress management technique, an attention controlling procedure, a refocusing element to guide thoughts and feelings in a more positive direction (Morris & Summers, 1995).

Stress inoculation training is not a single technique, but a general term referring to a treatment combining didactic teaching, Socratic discussion, cognitive restructuring, problem solving and relaxation training, behavioural and mental rehearsal, self-monitoring, self-instruction and self-reinforcement, and attempting to modify the environment (Meichenbaum, 1985).

Listed below are some general guidelines for managing anxiety:

- Focus on what can be controlled

- Thinking about practice situations

- Remembering the worst case scenario

- Keeping active

- Using cognitive strategies

- Developing a mental plan

- Being realistic

- Having fun

- Avoiding using the W-I-N word

- Using game simulation in practice

- Keeping things in perspective

- Systematic desensitisation (Morris & Summers, 1995).

2.2.3   ATTENTION

This section first highlights the attentional problems that necessitate attentional training. The section is then subdivided into an explanation of what attention entails, theoretical models of attention and concludes with techniques to enhance attentional skills.

According to Hardy et al. (1996), attention can impact on performance in two ways. Firstly, a loss of concentration can impair performance. Secondly, maintaining concentration can possibly be a problem for some athletes.

Weinberg & Gould (1999) contend that attending to past events can cause an athlete to lose focus. A lot of athletes can't forget a bad mistake that just occurred. This prevents them

from focusing on the present Conversely, attending to future events is also a problem. This is more prevalent with younger athletes who think about the repercussions of particular actions. Such thinking usually occurs in the form of "what if?" remarks. This type of worrying adversely impacts on concentration, causing a stronger likelihood of mistakes and poor performance. Besides worry being distracting in itself, it also causes excess muscle tension that obstructs performance too (Weinberg & Gould, 1999).

Attending to too many cues can also be a major impediment to concentrating optimally. There are too many distractions in the environment vying for the athlete's attention. Spectators may influence concentration and resultantly performance by forcing the athlete to try too hard, but they may also have a positive effect by making the athlete play better to impress those that he knows (Weinberg & Gould, 1999).

In order to deal with concentration problems like those just noted attentional training has been included in the PST programme.

2.2.3.1 *What is attention?*

A brief definition of attention will be followed by an explanation of the two dimensions of attention.

Morris & Summers (1995, p.64) cite William James (1890) definition, which defines attention as "...the taking possession by the mind, in clear and vivid form, of one out of what seem several simultaneously possible objects or trains of thought. Focalisation, concentration of consciousness is of its essence. It implies withdrawal from some things in order to deal effectively with others." Within the sporting context, athletes use the term "focus" to describe concentration (Winter & Martin, 1993).

Hence, a key dimension of attention is *selectivity*, i.e. focussing on relevant environmental cues whilst ignoring irrelevant cues. Another important aspect is that the focus of our mental effort is *shiftable*. Some shifts are involuntary like when attention is diverted to a sudden change, such as a loud noise. Other shifts are voluntary. Shifts may also be from internal to external stimuli or vice versa. Attention may also have *more than one focus* at a time (Morris & Summers, 1995).

2.2.3.2 Models of attention

Nideffer's theory of attentional style has emerged as the leading theory of attention in sport psychology. However, Boutcher's preliminary integrated model of attention and sports performance, the information processing theory, and Allport and Kahneman's limited supply of resources theory will also be discussed.

The most beneficial research on the role of attentional style in sport has developed from Robert Nideffer. Nideffer theorises that attentional focus lies on two dimensions viz. Width (broad/narrow) and direction (internal/external). A broad attentional focus lets one perceives numerous occurrences at the same time. This type of attention is important where athletes have to contend with a rapidly changing environment. A narrow attentional focus is required when an athlete is only responding to one or two cues. An external focus directs attention outward on an object or opponent. An internal focus is aimed inward at thoughts and emotions (Weinberg & Gould, 1999). Sports differ in their requirements for focusing. The optimal attentional focus of a sprinter should be narrow internal (Cox, 1994). The present project aims to categorise into which quadrant the athlete falls.
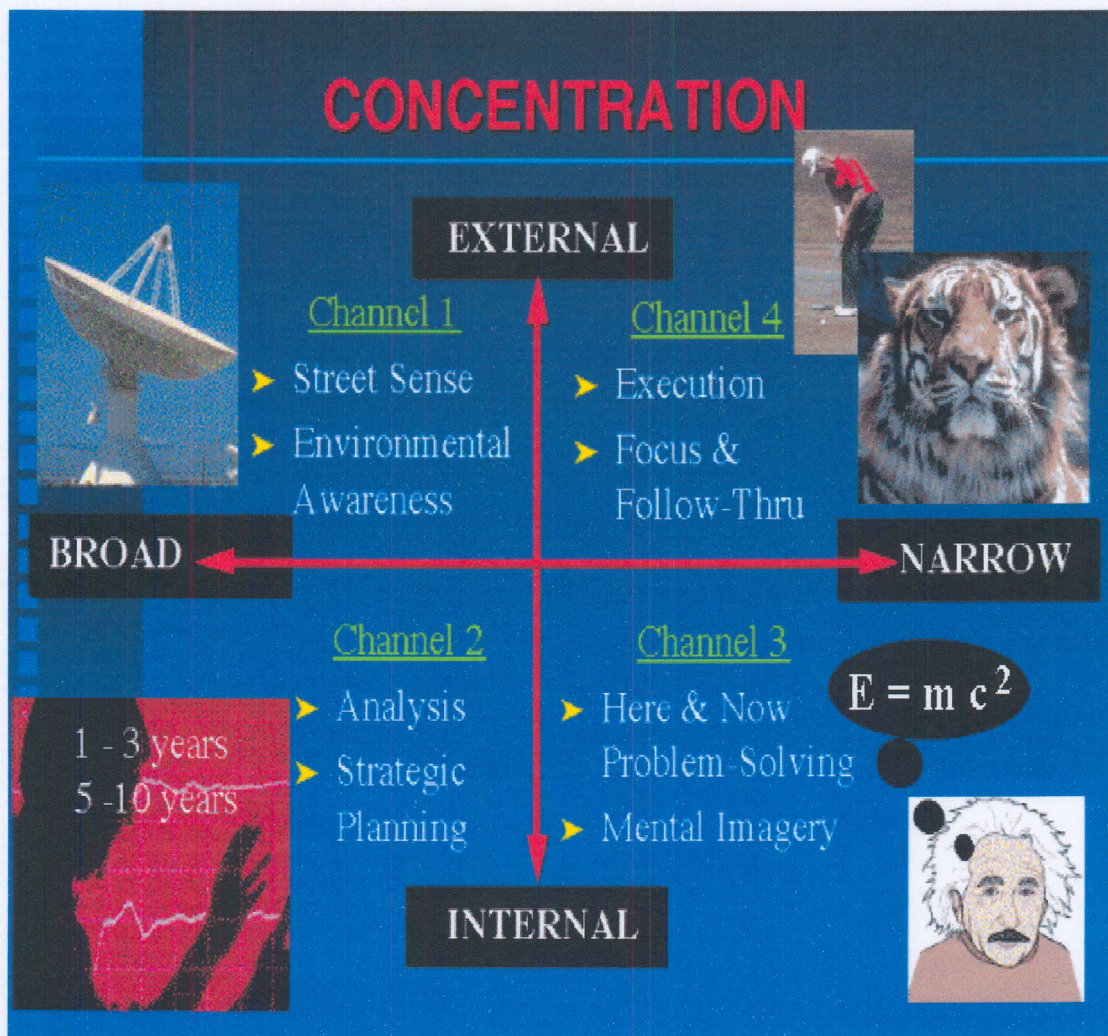
Figure 8. Dimensions of attention.

Boutcher's preliminary integrated model of attention and sports performance takes into account individual differences, environmental influences, and fluctuations in the athlete's arousal level, and infers that attention may be evaluated in various ways. This model predicts that enduring traits, demands of an activity and environmental determinants impact the level of physiological arousal. When a task is being executed, this arousal is channelled into either controlled processing, automatic processing, or a combination of the two, depending on the nature of the task. Optimal attentional states are achieved when the athlete has achieved an exact balance between controlled and automatic processing required for that specific task. The feedback loops in the model allow for interaction between the numerous factors and for attention to be affected during and after performance. Hardy et al. (1996) suggest that this model is relatively speculative, with the current format being too vague and simplistic.

The information processing theory presumes that there is a limit to how much information can be processed at a particular time. Consequently, one needs to be selective in what is processed in order to prevent a cognitive overload. The argument is that there is a bottleneck somewhere in the information-processing system that enables one to perceive only a portion of the information present in our environment (Morris & Summers, 1995).

Morris and Summers (1995) discuss Allport's (1980) and Kahneman's (1973) limited supply of resources theory that presumes there is a limited supply of cognitive resources that are undifferentiated and unspecialised. These resources can be freely allocated in varying amounts to different tasks. Hence, any number of tasks may be performed simultaneously as long as the cumulative demand on resources does not exceed the given supply. If however, the demand is greater than the limit, performance on one of the tasks will deteriorate. The implication of this theory for an athlete is that in numerous sporting situations there is a large amount of relevant and irrelevant data that can be processed which

presents the athlete with a potential overload. To deal with the situation the athlete has to learn what to attend to and what to ignore, and when to shift attention (Morris & Summers, 1995). Extensive practice is one way to decrease resource demands, as it leads to *automaticity.* Automatic processing is the "activation of a learned sequence of elements or behaviours in permanent memory," (Moates & Schumacher in Morris & Summers, 1995, p.66). This allows fast, effortless performance not requiring conscious control.

2.2.3.3 *Enhancing attentional skills*

Both behavioural and cognitive strategies can be used to enhance attentional skills. Behavioural techniques include game simulation activities, practicing under unfavourable conditions, utilising cue words, routines, eye control and centering. Cognitive methods to improve focus are non-judgemental thinking, remaining focused in the present, stopping or parking thoughts, shifting attention appropriately, mental imagery and performance segmenting. These methods will be discussed briefly.

The first behavioural strategy, that is, game simulation activities, reduces the negative outcomes associated with novelty as well as the stress related to high level races. Morris and Summers (1995) presume that when athletes have been practising in an environment close to the race settings, then they will have enhanced coping strategies for the real race. The closer the practise sessions resemble the actual race, the better the effect. Simulation training takes two forms, viz. Physical practice in the presence of simulated competition stressors and metal rehearsal of the actual competitive event.

Secondly, the more an athlete practices under unfavourable conditions and with distractions present, the better prepared he is to deal with them during an actual race (Weinberg & Gould, 1999).

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Cue words may help to trigger specific responses. For example, a sprinter may say "explode" to ensure that he gets off the starting blocks well. A cue word can be instructional, motivational or emotional (Weinberg & Gould, 1999).

Routines focus concentration and aid in mental preparation for a race. Mental imagery and cue words should be incorporated into routines too. When a sprinter is not actually running (e.g. during breaks in competition) the mind may often wander. Making imagery and cue words part of one's routine during this time can assist the athlete to mentally focus for the race. It also allows the athlete to be more task focused and balance emotional states (Weinberg & Gould, 1999). Winter and Martin (1993) use pre-competition routines as well as within-competition routines in order to focus concentration in their programme. Their pre-competition routine include preparation in terms of diet, travel, warm-up, visualisation and goal setting and should be adaptable to any competition venue.

Athletes must practice eye control. As eyes wander and focus on task-irrelevant cues like the crowds, opponents' action, coaches and team-mates, so does the mind. Eyes should be kept on the floor, focused on equipment, or on an empty spot on the track (Weinberg & Gould, 1999).

Although centering is a relaxation technique it is also used to focus attention. Athletes have always known that an easy way to refocus after concentration starts to decline is to take a deep breath and relax the muscles. Winter and Martin (1993) also use centering as a focusing method.

A cognitive strategy that can be used by the athlete is non-judgemental thinking. What usually leads to a drop in performance is the tendency to judge performance all the time and

classify it as good or bad. Once this happens, the athlete starts to generalise about certain aspects of his behaviour. The brain then overrules the body causing extra muscle tension, more effort, a drop in concentration, and impaired decision-making (Weinberg & Gould, 1999). Faults should not be ignored entirely, but look at nonjudgementally. Athletes should not automatically generalise that they are pathetic sprinters. They should look objectively at what affected performance that day, and see constructively what can be done about it (Weinberg & Gould, 1999).

Staying focused in the present also helps to concentration. Past- and future-orientated thinking tends to produce attentional difficulties. Avoid thinking about what just happened, or what might occur. Remaining in the present/immediate future forces a focused concentration throughout the race (Weinberg & Gould, 1999).

If an athlete's mind wanders into the past, future or lingers on irrelevant matters, he should try the technique of thought stopping. When the athlete becomes aware of negative or distracting thought, he should eliminate the thought by saying/thinking something like "stop", I'm not going to think about this", etc. Some athletes "see" a big red stop sign in their mind, others find an action like snapping their fingers to stop themselves from thinking about something. He should then replace the negative thought with realistic self-talk by focussing on something that is task relevant (Potgieter, 1997).

Distracting thoughts can be dealt with by parking them, i.e. put them aside for another time after the race. Write the thought on a paper and put it away, use a self-talk instruction or visualisation. After the race deal with the issue by "unparking" it (Morris & Summers, 1995).

Learning to shift attention helps an athlete to shift focus across internal-external and broad narrow dimension (Weinberg & Gould, 1999).

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When an athlete makes an error, he should use it as an opportunity to learn. Quickly analyse why the mistake was made and mentally rehearse the way it should be done correctly (Morris & Summers, 1995). Rehearsing game concentration by using mental imagery is good practice for concentration. A sprinter may see herself get a great start of the blocks, hit their strides, and then stay loose and relaxed during the last 20 yards in the race, where they actually usually tighten up (Weinberg & Gould, 1999).

Winter and Martin (1993) also use a strategy called performance segmenting. The competition is segmented in terms of logical divisions in performance. By breaking the race down into segments, and having a plan for each segment, concentration is improved.

2.2.4   MOTIVATION

Motivation affects one's choice of activity, the effort deployed to pursue goals, the intensity of effort when pursuing goals, and persistence when confronted with adversity and failure (Weinberg & Gould, 1999). Motivation is what pushes an athlete to train day after day and to work harder to improve performance. When coaches are questioned about essential qualities of successful athletes, strong self-motivation and personal commitment are consistently mentioned. Lay persons commonly equate sport psychology with motivation. Inevitably, motivation has also been included in the programme (Winter & Martin, 1993). This section on motivation commences with an elucidation of the concept of motivation. It is followed by elaborations on the different theoretical views of motivation, and closes with guidelines to build motivation.

2.2.4.1   What is motivation?

Several concepts are fundamental to understanding motivation within the sport psychology context. Motivation, amotivation, intrinsic motivation (to know, toward accomplishments, and to experience stimulation) extrinsic motivation (external regulation, introjection and identification) as well as achievement motivation will be defined.

Motivation is "the direction and intensity of one's effort" (Sage, cited in Weinberg & Gould, 1995, p.60). Direction of effort indicates whether one seeks out, approaches, or is attracted to certain situations while Intensity of effort denotes the amount of effort one applies to a specific situation (Weinberg & Gould, 1999).   The relationship between direction and intensity is illustrated in Figure 9 (see Appendix A).

Amotivation is very similar to the concept of learned helplessness. Amotivated athletes do not see a connection between their actions and the outcomes of their actions. They feel incompetent and a lack of control. They are neither intrinsically nor extrinsically motivated. They feel that they no longer have any good reasons to train. Eventually they drop out of the sport in question (Pelletier, Fortier, Vallerand, Tuson, Brière & Blais, 1995).

Within the sporting context, intrinsic motivation (IM) refers to participating in a sport solely for the pleasure and satisfaction derived from it. An intrinsically motivated athlete participates in sport voluntarily, in the absence of material rewards or external restraints. The tripartite taxonomy of IM recently proposed, reveals the presence of three types of IM: IM to Know, IM to Accomplish things, and IM to Experience Stimulation. IM to Know prevails when an athlete participates in a sport for the satisfaction experienced when learning something new and discovering knew techniques. IM toward Accomplishments is the motivation to participate in sport in order to feel competent and create unique achievements.   IM to Experience

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Stimulation pushes an athlete into a sport to experience stimulating sensations (Pelletier et al., 1995).

Extrinsic motivation (EM) drives an athlete into a sport as a means to an end and not for their own sake. Different types of EM can be ordered along a self-determination continuum. From lower to higher levels of self-determination, they are external regulation, introjection and identification. External regulation refers to behaviour that is directed by external factors like material rewards or constraints imposed by others. Externally regulated athletes partake in sport to receive praise from their coach or parents. In such cases, participation is not for fun but to gain rewards or to avoid negative consequences. With introjection, previously external sources of motivation have been internalised to the extent that their actual presence is no longer required to drive behaviours. Rather, the behaviours are reinforce through internal pressures like guilt and anxiety. Athletes will therefore participate in sport because they feel compelled to be in good shape, and feel embarrassed when they are not in best form. Identification predominates when the athlete values participation in sport as important and therefore performs it out of choice. At this level, although the activity is still performed for extrinsic reasons, it is internally regulated and self-determined. They are participating in sport because they feel their involvement contributes to their growth and development as individuals (Pelletier et al., 1995).

The three types of IM will be measured in the present study, and aggregated to give a global measure of IM.

Competitiveness is the sporting term used for achievement motivation. Martens (1976) defined it as "a disposition to strive for satisfaction when making comparisons with some standard of excellence the presence of evaluative others " (Weinberg & Gould, 1999, p. 74). It is important to look as achievement motivation as situation-specific. Martens's definition is

restricted to circumstances where one is being evaluated by others. But many athletes compete with themselves even when they are not being evaluated by anyone else (Weinberg & Gould, 1999).

2.2.4.2 *Theoretical views of motivation*

In terms of motivational theories, the energisation theory, cognitive evaluation theory, trait-centred view, situation-centred view and interactional view will be elaborated upon.

The energisation theory (see figure 10, Appendix A) predicts that performance and goal attractiveness are facilitated by difficult but attainable goals. Also, potential motivation is a function of an athlete's need for a goal, the incentive value of the goal and the degree to which he expects to receive the goal if the task is completed (Wann, 1997). Research testing the principles of the energisation theory has been supportive. However, it has not been tested in sport settings (Wann, 1997).

According to the cognitive evaluation theory (see figure 11, Appendix A) people have an innate need to feel personally competent and self-determining. Hence, particular events will increase motivation to the extent that they enhance athlete's perceptions of personal competence and self-determination. Conversely, if a specific event causes a decrease in the athlete's perceptions of either their personal competence or self-determination, then intrinsic motivation too will decrease. Self-determination is operationalised in terms of locus of causality (Hardy et al., 1996).

Cognitive evaluation theory accounts for two types of rewards. Controlling rewards aim to affect an athlete's behaviour, and decrease intrinsic motivation. Informational rewards provide information about one's competence at a task, and tend to increase intrinsic

motivation. If an athlete thinks that the coach's praise is intended to control behaviour, this praise will decrease her intrinsic motivation, but if the athlete thinks that the praise is supposed to provided information about her successful performance, intrinsic motivation will increase. Therefore, trainers have to very careful abut the rewards they give to athletes (Wann, 1997).

In terms of the participant-centred or trait-centred view, motivated behaviour is predominantly a function of individual characteristics. Therefore personality, needs and goals of an athlete determine motivated behaviour. Some athletes have characteristics that predispose them to success and high levels of motivation, whereas others are naturally susceptible to being unmotivated. This theory has generally been rejected because it ignores environmental factors in determining motivation (Weinberg & Gould, 1999).

The situation-centred view is the direct opposite of the previous one. This view asserts that motivation level is essentially determined by the situation. This view has not been favoured as there are lots of times when athletes remain motivated in spite of their negative environment (Weinberg & Gould, 1999).

The Interactional view (see figure 12, Appendix A) contends that motivation is a function of the interaction between participant factors and situational factors. This view has been most widely accepted (Weinberg & Gould, 1999).

2.2.4.3 Guidelines to build motivation

Goal setting is the single most important method of strengthening motivation and achievement motivation. This will be discussed in more detail. Other concepts relevant to building motivation that will be highlighted are attributions, attending to unique and shared

motives in groups, structuring situations, how leaders affect motivation, behaviour modification, visualisation and different motives.

Goal setting is the process of selecting acceptable targets and objectives. These targets and objects are called goals. Goals may be technical, tactical , psychological or physiological. According to Silva and Weinberg (1984), goal setting is generally seen as a motivational tool. However, goals also provide focus and direction. They also produce better results and provide additional ways of developing an athlete (Morris & Summers, 1995). Winter and Martin (1993) contend that short term goals provide an athlete with the direction and motivation required attaining long-term goals.

There are seven primary principles of goal setting:

1. Make goals as specific as possible

2. Divide long-term goals into a series of short-term goals with deadlines

3. Provide clear and regular feedback to the athlete

4. Make goals challenging, not too easy nor too difficult

5. Be flexible. Goals may need to be altered if circumstances change.

6. If the coach, athlete and sport psychology set goals together, the athlete tends to be more commitment to the achievement of the goal setting.

7. Write down the goals, prioritise and set clear time frame. Keep a goal diary (Morris & Summers, 1995).

On a formal level, goal setting is going to be used as the primary motivational tool in the present programme.

Several other methods of building motivation are:

- Monitor and alter attributional feedback. Mastery goals must be emphasised and attributions linked to the individuals goals (Weinberg & Gould, 1999).

- Inappropriate attributions must be assessed and corrected. The attributions athletes make in practice and competition must be continually monitored. The maladaptive attributions must be corrected and that athletes use attributions that facilitate achievement motivation should be ensured (Weinberg & Gould, 1999).

- The environment can be changed to enhance motivation. By dividing athletes into competitive and recreational division, it enhances participation rates, as athletes can play at a level they're comfortable with (Weinberg & Gould, 1999).

- Leaders influence motivation. An instructor's actions or inactions and attitude can impact on the motivational environment. Hence it is necessary to sometimes act more upbeat than one feels (Weinberg & Gould, 1999).

- Behaviour modification can be used to change undesirable participant motives. Sometimes a participant has negative or entirely extrinsic motives for engaging in sport. In such settings it may be appropriate to alter motives (Weinberg & Gould, 1999).

- Individuals within groups should be flexibly attended to. Athletes have shared and unique motives. Although there are some general motives, bear in mind that motives can vary greatly, and some athletes can have very unique motives. The following guidelines can give some idea of the athlete's motives:

  (i)   Observe the athletes and take note of what they like and don't like about the sport

  (ii)   Informally talk to significant others and try to gain an idea of the motives for participation

(iii) Continually ask the athletes to write out their reasons for participating (Weinberg & Gould, 1999).

- Both situations and traits motivate people. Hence both should be taken into account (Weinberg & Gould, 1999).

- At times an athlete may want to be doing something else as well. It is important to be aware of these conflicting interests. They can impact strongly on participation (Weinberg & Gould, 1999).

- People have multiple motives for involvement and it is extremely important to understand why the athlete is participating. Possible motives are provided in Table 3 (Weinberg & Gould, 1995).

Table 3

Motivational Categories For Sport Participation

Category	Description
Social Approval	Parental, peer or coach approval
Competition	Against time, fellow team members and rival teams
Self-mastery	Achieving control over mind and body
	Feeling more in control of body movements
	Learning new skills
Lifestyle	Habit
	Lack of something better to do
	Introduced to activity at an early age
	Parents decided this for you

Fear of failure	Critical comment from others
	Self-criticism
	How others might view your performance
Physical fitness and health	Feeling healthy
	Increased muscle tone
	Keeping in good shape
	Gaining greater physical strength
Friendship and personal associations	Fellow team members
	Models
Success and achievement	Participating in important contests
	Achieving in training and personal goals
Tangible pay-offs	Athletic scholarships
	Travel
	Extra attention
Recognition	Peers, public and special people
	Younger and older people
Intimidation/control	Coach being angry at you
	Coach directing and running your life
Heterosexuality	Being more attractive to the opposite sex
Competing conditions-crowds	Competing before a large enthusiastic crowd
	Being seen as a 'favourite'
Independence-individuality	Deciding your own training schedule
	Being viewed as an individual
	Practising alone
"Family"	Team members, coaches and opponents
Emotional release	Letting you feelings out
	Feeling exhilarated

Status	Seen as important, a role model
	Feeling respected
Self-direction/awareness	Getting a focus in life
	Attaining a greater sense of confidence
	Feeling special as a person
Understanding reasons	Understanding reasons for techniques and regulations

The coach should attempt to provide multiple opportunities. Structuring a situation to enhance motivation, may imply that all motives must be taken into account. This also enhances performance (Weinberg & Gould, 1999).

- Winter and Martin (1993) also use visualisation to enhance motivation. This is another example of a psychological skill also being a psychological method. Visualisation will be discussed in more detail in the following section.

Motives change over time. Motives for participation must be continually monitored to detect these changes (Weinberg & Gould, 1999).

2.2.5 MENTAL IMAGERY

This section on mental imagery continues with a rationale for including imagery training in the present programme. Following in the subsequent sections are a discussion of what exactly mental imagery is, theories of how it works, and basic guidelines of imagery training. There are numerous anecdotal reports of mental imagery working.

Several good athletes and international coaches include imagery in their daily training. Weinberg and Gould (1999) cite a study conducted at the United States Olympic Training Centre by Murphy, Jowdy and Durtschi (1990), concluded that 90% of Olympic athletes used some form of imagery and 97% of these athletes felt it helped their performance. Also, 94% of coaches of Olympic athletes used imagery during their training sessions. Weinberg & Gould (1999) also cite case studies by Lane (1980), Titley (1976) and Suinn (1976) that reported significant improvement in performance after using imagery. Feltz and Landers (1983), Richardson (1967) and Weinberg (1981) (cited in Weinberg & Gould, 1999) have provided scientific experimental evidence supporting the use of imagery in learning and performance enhancement. The effectiveness of imagery has been shown in basketball, football, swimming, karate, skiing, volleyball, tennis, track and field, scuba diving, soccer, volleyball, gymnastics and golf (Weinberg & Gould, 1995; Wann, 1997).

Cumulatively the studies reveal that imagery is very helpful to performance. Hence, the inclusion of imagery training in the present research project (Wann, 1997).

2.2.5.1   What is mental imagery?

This section sets forth the definition of mental imagery, lists the different types of imagery and highlights the importance of mental imagery by elucidating the uses and applications of imagery within sport.

Mental imagery, visualisation, mental rehearsal/practice and visual motor behaviour rehearsal all refer to creating or recreating an occurrence in the mind (Weinberg & Gould, 1999).

Corbin (in Morris & Summers, 1995, p. 341) defines mental practice as "the repetition of a task, without observable movement, with the specific intent of learning". Richardson's

definition (in Morris & Summers, 1995, p. 341) conceptualises mental imagery as "all those quasi-sensory and quasi-perceptual experiences of which we are self-consciously aware and which exist for us inn the absence of those stimulus conditions that are known to produce their genuine sensory or perceptual counterparts".

There are two primary types of imagery, internal imagery and external imagery. Internal imagery is when one imagines executing a skill from his/her own vantagepoint. A runner would see the track from his point on it, feel the ground where he's standing, and see the crowds from the field. Because internal imagery is from a first person perspective the images accentuate the feel of the movement. External imagery allows one to see himself as an external observer would. It allows a person to see himself as if on videotape. With this type of imagery, the kinaesthetic feel of the movement is minimised. Very little difference has been found between internal and external imagery with regard to performance. Weinberg and Gould cite Murphey et al.'s 1990 survey with Olympic athletes which revealed that they used both. What is important is that the athlete gains a vivid controllable image. Some evidence suggests that internal imagery may be preferable as it makes it easier to bring in the kinaesthetic sense, feel the movement, and simulate actual performance skills, but the research is still inconclusive (Weinberg & Gould, 1999).

There are numerous applications of mental imagery. Imagery immediately after physically practising a new skill or even integrated with it may be very effective in learning a new skill. Regularly practising skills that have already been learnt is essential. Mentally practising skills may be done during long trips or when an athlete is injured. In a closed skill sport like running, the sprinter knows precisely what the performance entails. Mentally rehearsing the complete race can help to automate the sequence. Although this can be done at any time, when it's done just before the race it is called a preview. The whole race can also be replayed afterwards. Reviewing positive aspects can boost self-confidence, while attending to the

negative, allows one to detect weaknesses and errors that can be worked on. Review should be left until a few hours after the competition, as one is usually relatively emotional after a match or race (Morris & Summers, 1995).

Strategies may be learnt through using imagery. This is particularly beneficial in team sports. Members of a team can use imagery to enhance their performance of a new offensive strategy by familiarising themselves with the roles of their team mattes, as well as fitting in temporally and spatially. Once the strategy has been learnt imaging strategy implementation against the actual competitors can aid in sharpening the strategy the week before competition (Morris & Summers, 1995).

Just as it is important to warm up cold tight muscles to prepared for the first few minutes of the match, it is as necessary not to be mentally cold. Imagery can serve as a mental warm-up (Morris & Summers, 1995).

Examine a routine or a skill to detect a problem and then correct it in preparation for the next physical practice session or competition. Running though the skill at regular pace in order to identify the section where the problem occurs can be ensued by a slow motion rerun for the detailed examination of the precise difficulty (Morris & Summers, 1995).

Imagining a relaxing scene can produce feelings of relaxation. First practice imagining a relaxing scene on your own at home, then just before practice, and when you're used to it before a competition. If anxiety is cognitive and not physiological imaging a scene where you are coping effectively helps (Morris & Summers, 1995).

Imagery can be used to developing psychological skills. An example here could be to imagine the concentration developing exercises. To build self-confidence, imagine being

confident and successful, but also be realistic (Morris & Summers, 1995).

Imagery can propitiate physical recovery from injury, especially to soft tissue. It can also be applied to the aches that are related to heavy training. Physically, an increased blood flow to an injured area, as well as warmth speed up recovery. Hence, imagining the increased blood flow and warmth can lead to measurable increases in specific areas (Morris & Summers, 1995).

2.2.5.2   *Theoretical views*

Although there is general consensus that the use of mental imagery has a positive impact, there are different perspectives as to why it is actually beneficial (Wann, 1997). Psychoneuromuscular theory, symbolic learning theory, psychological skills hypothesis, and the set theory all provide different explanations.

Psychoneuromuscular theory contends that imagery propitiates performance by producing 'innovation' (stimulation) in a person's muscles that is very similar to actual physical movements (Wann, 1997). When an athlete imagines himself in a particular physical activity, there are small characteristic undetectable muscular impulses reflecting the visualised activity. Wann (1997) cite studies by Hale (1981), Harris and Robinson (1986), Jacobson (1931), Wang and Morgan (1991) and Suinn (1976) that all indicate evidence supporting this theory.

Symbolic learning theory asserts that imagery enhances performance by providing a person with a mental code and plan of his movements, thereby making the movement more familiar and automatic. Wann (1997) cites Hind et al.'s (1991) and Ryan and Simmons's (1981) empirical evidence advocating this view. The support lies in the finding that imagery is most

successful with activities that have a large cognitive component (Wann, 1997).

There is also the psychological skills hypothesis. Recently sport psychologists have been proposing the view that imagery also works through the development and refinement of psychological skills. Imagery can enhance concentration, decrease anxiety and boost confidence. These are all necessary skills to improve performance. Imagery is also a beneficial instrument to practice and lean several psychological skills (Weinberg & Gould, 1999).

The set theory presumes that imagery facilitates performance by assisting the athlete to modify his level of physiological arousal for optimal performance and helping the athlete to pay attention to task-relevant cues only (Potgieter, 1997).

2.2.5.3   *Basics of imagery training*

This section provides information about specific times when imagery should be used, the two key dimensions of imagery training, as well as the limitations of mental imagery.

Imagery should be used before and after practice. Have a 10-minute imagery session before and after each practice session. Before practice, the athlete must visualise the skills, routines and plays they will be performing. After practice, the athlete must review the strategies they worked on. As the sensations of the movements will still be fresh in their minds, it can improve the imagery . Imagery should also be used before and after competition. Imagery before a competition helps to refine actions and reactions. Imagery should fit with ease into the precompetition routine. After an event the athlete get a good image of the things that were done well. Imagery can be used in breaks in action during competition and practice (Weinberg & Gould, 1999).

It may sometimes be difficult to find a quiet spot before practice, so there may be times when an athlete does not practice imagery for several consecutive days. At such times the athlete must schedule 10 minutes at home so that the imagery routine is not interrupted (Weinberg & Gould, 1999).

When recovering from injury, imagery can be extremely beneficial. Athletes have to be trained to use imagery with relaxation techniques to minimise anxiety about an injury. They can also use imagery to rehearse physical performance skills. Ieleva and Orlick (1991) as cited in Weinberg and Gould (1999) found that positive healing imagery and performance imagery was related to quicker recovery times (Weinberg & Gould, 1999).

There are two key dimensions to imagery, viz. vividness and controllability (Weinberg & Gould, 1999). Vivid images require that all the senses must be used to make the images as detailed and realistic as possible. The experience should come "alive" in the mind. The more the image resembles the actual event, the greater the transfer to actual performance. The athlete should see the stadium, the type of surface, and the spectators; feel the emotions and thoughts of competition; and try to hear the sounds when a race is in progress - the cheering and the commentators. The athlete also has to be able to control the image. The athlete must learn to manipulate the images so that they do what they are being instructed to do. Being able to control images allows the athlete to visualise what has to be accomplished, instead of seeing errors (Weinberg & Gould, 1999).

There are however some limitations of imagery. Imagery is only beneficial if the person has some skills of the task in question to serve as the basis for the mental practice. The greatest contribution of imagery is in activities that have cognitive and visual components. In 1988, Burhans, Richman and Bergey's as cited in Weinberg and Gould, (1999) study of runners did

not find any differences between subjects who had imagery and those who didn't. The final inadequacy is that only imagining behaviour is not enough. A positive outcome has to be visualised too (Weinberg & Gould, 1999).

2.3   SPRINTING

An elaborate discussion on sprinting is not required in the present study, as the psychological skills rather than the technical skills are the focus of the programme. The proceeding sections on sprinting therefore only define sprinting, and the respective segments in the 100 metre race.

2.3.1 WHAT IS SPRINTING

Sprinting is a type of running where the athletes run the entire distance at their maximum speed. It requires an all-out effort by the sprinter to move as fast as he/she can over the designated distance in as short a time as possible (Cooper, Lavery & Perrin, 1970). F.A.M. Webster defines sprinting as the "running of such short distances as a man can cover at top speed in one continuous effort (Warden, 1986).

There are three basic sprinting events; namely the hundred metre sprint, the two-hundred metres sprint and the four-hundred metres sprint.

The present study assesses performance on the hundred metre sprint.

2.3.2   THE HUNDRED METRE SPRINT

The following section set out the specific segments of the one-hundred metre race in detail. A

basic understanding of the segments is necessary to understand the athlete's motives for establishing certain goals, as well as assisting the sprinter to segment the race for concentration purposes.

The 100m race is basically segmented into the start, leaving the blocks, full speed sprinting and sprinting through the finish tape. Based on coaching experience and experimental evidence, the procedures tabulated in Table 4 (see Appendix B) have been suggested (Cooper et al., 1970).