Chapter-One

What is sport psychology?

Because there are many ways in which we can apply psychology to sport and, given the wide range of activities that different cultures regard as sport, it is helpful to adopt quite a broad definition of sport psychology. In 1996, the European Federation of Sport Psychology (FEPSAC) produced such a broad definition, which, slightly simplified, reads, '*Sport psychology is the study of the psychological basis, processes and effects of sport*.' This of course begs the questions, what is sport and what is psychology? Although many athletes would insist that sport necessarily includes an element of competition, the term **'sport'** is used, both in the FEPSAC definition of sport psychology, and throughout this course, in the broadest sense, including ***any physical activity for the purposes of competition, recreation, education or health***. Psychology is often defined as '***the science of mind and behaviour'*** (Gross, 2005).

Sport psychology (or sports psychology, as some prefer) is thus a broad church. Many American sport psychologists draw a sharp distinction between academic sport psychology, which focuses on all the factors affecting participation and performance in sport, and applied sport psychology, which focuses purely on applying psychology to enhance athletic performance (e.g. Cox, 2001). At the time of writing, European writers generally do not subscribe to this rather rigid distinction (Kremer & Scully, 1994), and this book crosses freely between academic and applied sport psychology.

A brief history of sport psychology

Sport psychology has existed in some form for almost as long as psychology itself. The first recorded study in sport psychology took place at the close of the *nineteenth century*. Norman Triplett (1898) performed what is often cited as the first experiment in social psychology as well as the first in sport psychology. Triplett investigated the phenomenon of *social facilitation,* in which performance is affected by the presence of others. He demonstrated that cyclists tended to cycle faster when racing against other cyclists than they did alone. Triplett did not pursue further sport-related research, however, and it was not until the 1920s that the discipline of sport psychology was formally established.

In 1925, ***Coleman Griffith*** set up the Athletic Research Laboratory at the University of Illinois. Griffith, who also put sport psychology on the map by establishing a university course, publishing two major textbooks and acting as a consultant to professional sports teams, is often called the '***father of sport psychology'***. The early path of sport psychology did not run smoothly, however, and the Athletic Research Laboratory closed in 1932 due to lack of funds.

Between the 1930s and the 1960s (at least in the Western world), there was little activity in the field of sport psychology. In the Soviet Union, sport psychology emerged as a discipline shortly after the Second World War. It is of course difficult to obtain accurate information about the practice of Soviet psychology during the Cold War, but it is commonly believed that, during the 1960 Melbourne Olympics, Eastern European teams employed sport psychologists (Kremer & Scully, 1994). Certainly, we know that, by the early 1970s, East German and Soviet teams were routinely employing sport psychologists to enhance athletic performance in international events.

Sport psychology reappeared in the USA in the 1960s, and was taken up in Britain and the rest of Europe a few years later. The area has since expanded worldwide to become one of the fastest growing new academic disciplines. Until very recently, the study of sport psychology was firmly located in the domain of sport sciences as opposed to within psychology. This may be changing, however. In 1986, the American Psychological Association officially recognised sport psychology as a branch of psychology, and in 1993 the British Psychological Society formed a Sport and Exercise Psychology Section, which has now become a full division of the society.

What is a sport psychologist?

We can think of this question in two ways; first, who can call himself or herself a sport psychologist, and second, what do sport psychologists do? To address the first question, currently, in Britain, there is no compulsory registration of sport psychologists; therefore, in theory, anyone can call himself a sport psychologist. In reality, of course, it would be highly unethical for anyone not properly trained to use the title 'psychologist' in any context. At the time of writing, legislation is being brought in which will place legal limits on the use of the term.

The British Association of Sport and Exercise Sciences (BASES) keeps a register of approved sport psychologists. At the 1998 annual conference, the British Psychological Society (BPS)'s Sport and Exercise Psychology Section (now 'Division') approved the principle of granting the title *Chartered Sport Psychologist* to appropriately qualified people. At the time of writing, legislation is at the consultation stage to restrict certain titles, including *Chartered Sport* and *Exercise Psychologist*, to those on a register, to be maintained by the Health Professions Council. To register with BASES as a sport psychologist, one needs either a first degree in psychology and a higher degree in sport science *or* a first degree in sport science and a higher degree in sport psychology.

To achieve chartered status from the BPS, it is necessary to have a BPS-approved first degree in psychology and BPS-approved postgraduate training, including supervised practice. There is currently no such approved postgraduate training. A similar situation exists in the USA, where, although the American

Psychological Association (APA) has a Division of Sport Psychology (Division 47), it does not accredit courses.

There is some controversy surrounding the accreditation of sport psychologists. The BASES scheme for registration of sport psychologists has existed only since 1992, and many people who were already working as sport psychologists chose not to join the register or were unqualified to do so. Anshel (1992) has pointed out that many of those working full-time with athletes do not have the time, resources or inclination to pursue the lengthy procedures necessary to become registered, and that registration thus excludes some of the Britain's most experienced practitioners. On the other hand, compulsory registration would provide a measure of protection for the public from dubious or under qualified practitioners. With regard to the second question, the work carried out by sport psychologists is quite varied. The European Federation of Sport Psychology (1996) recognises three interrelated tasks for sport psychologists:

• *research*; investigation into all aspects of the psychology of sport, both theoretical and applied

• *education*; teaching students, officials and athletes about sport psychology

• *application*; assessment of and intervention in psychological problems connected to sport. This can involve consulting to whole teams or counselling of individuals.

Box 1.1 Areas of focus for the BPS Division of Sport and Exercise Psychology

• psychology of elite performance

• individual and group processes in sport

• motor skill acquisition and performance

• motivational issues in sport and exercise

• psychological factors in adoption and maintenance of exercise behaviour

• sport, exercise and mental health

• professional practice in sport and exercise psychology.

Because sport psychology is now such a broad field, it is becoming impossible for sport psychologists to keep up with all aspects of their discipline. Nowadays, you will find that many sport psychologists have become highly specialised. For example, psychologists may specialize in the study of motivation.They may carry out research into motivation, teach coaches about motivation and perhaps work with individual athletes to improve their motivation.

Personality characteristics and sporting behaviour

One of the most basic questions faced by psychology is, 'Why are we all different?' Of course, in some ways, we are all much the same, as in the structure of our brains and the mechanisms of perception and memory. However, there are huge differences among us in the ways we think, feel and behave in response to particular situations. The psychology of personality is concerned with these individual differences. Pervin (1993) has offered a simple working definition of personality: 'Personality represents those characteristics of the person that account for consistent patterns of behaviour'. Broadly, four factors influence how we respond in any given situation: our genetic make-up, our past experience, the nature of the situation in which we find ourselves and our free will. Each of these factors is emphasized by one or more theories of personality.

Trait theories of personality emphasize the role of genetics in determining our individuality. Situational and interactional views place more emphasis on the particular situation and less emphasis on the nature of the individual in determining how we act. Trait, situational and interactional theories are all ambitious approaches to personality that aim to describe the entire nature of the person.

Narrow-band theories are less ambitious, focusing on a single aspect of personality. None of the main theoretical approaches to personality place much emphasis on free will; that is, how we choose to think, feel and behave. Free will is a controversial idea in psychology. Although we may believe that we choose how to behave, it is always likely that we are influenced to some degree by our genetic make-up and our past experiences.

In some ways, the study of personality underlies all sport psychology. When we look in later chapters at such topics as attitudes, aggression, motivation and anxiety, what we are really interested in is how and why people differ in these aspects, and how we can modify these to improve athletic performance. The answers to many of these questions can be found in personality theory.

Trait theories

There are two main assumptions underlying the trait approach to personality. Firstly, an individual's personality is made up of certain key characteristics or traits. Traits are the stable, enduring characteristics of a person. Secondly, individuals differ in each trait, at least partly due to their genetic differences. Traits can be measured according to three factors: their frequency, their intensity and the range of situations to which they can be applied. For example, a trait that

appears in most of the major theories is extroversion – how lively, sociable and impulsive an individual is. We are safe in saying that someone is highly extrovert if they display lively, sociable and impulsive behaviour, often to an extreme and in a variety of quite different situations.

Eysenck's theory

Eysenck (1952) initially proposed that personality could be completely described by just two traits, extroversion and neuroticism. *Extroversion* describes how lively, sociable and impulsive a person is, whilst n*euroticism* describes how emotionally stable they are. One question you might ask is why three different characteristics like liveliness, sociability and impulsivity are grouped together as one trait. The answer is that, through a mathematical process called *factor analysis*,

Eysenck discovered that in most cases, it is the same people who tend to be lively, impulsive and sociable. When characteristic behaviours tend to cluster together in this way, we can say that they make up one trait. Extraversion and neuroticism can be measured by a personality test called the Eysenck Personality Inventory (EPI).

A high score on the E scale would indicate that you are very extrovert whilst a low score would indicate that you are very introvert, that is, quiet, solitary, and not at all impulsive. A high score on the N scale would indicate that you are very neurotic, that is, emotionally unstable, whereas a very low score would indicate that you are a very stable, unflappable person.

Cattell's theory

Cattell disagreed with Eysenck's view that personality could be understood by looking at only three dimensions of personality. Instead he argued that it was necessary to look at a much larger number of traits in order to get a complete picture of someone's personality. Like Eysenck, Cattell used the mathematical technique of factor analysis to look at what types of behaviour tended to be grouped together in the same people. He identified 16 personality factors. Cattell produced a personality test similar to the EPI that measured each of the 16 traits. The 16PF, as it is called, has 160 questions in total, 10 questions relating to each personality factor.

Eysenck maintained that Cattell's 16 factors would fit neatly within his three. For example, the relaxed–tense factor, the placid– apprehensive factor, the relaxed–tense factor and the stable–unstable factor are all subsumed by Eysenck's trait of neuroticism. The argument between Eysenck and Cattell is really a mathematical one. To sport psychologists, what matters primarily is not who got his sums right, but which test is more useful in understanding sporting

Box 2.3 Cattell's 16 personality factors

reserved ↔ outgoing	unintelligent ↔ intelligent
stable ↔ unstable	humble ↔ assertive
sober↔ happy-go-lucky	expedient ↔ conscientious

shy ↔ adventurous	tough-minded ↔ tender-minded
trusting ↔ suspicious	practical ↔ imaginative
forthright ↔ shrewd	placid ↔ apprehensive
conservative ↔ experimenting	group-dependent ↔ self-sufficient
undisciplined↔ controlled	relaxed ↔ tense

The five-factor model of personality

Arguably, the most popular trait theory in contemporary personality psychology is the five-factor model, developed by Costa & McCrae (1985); however, sport psychologists have been fairly slow to recognize its importance, and there are few published studies making use of it. The five factors in this model include extroversion and neuroticism (similar to Eysenck's traits). In addition, the trait of openness describes the individual's ability to appreciate new experiences and tolerate the unfamiliar. Open people are curious and imaginative.

Individuals low in openness are conventional and narrow in their interests. Agreeableness (what we would call niceness in everyday speech) describes the extent to which one is compassionate and trusting, or hostile and ruthless. The final trait is conscientiousness, closely related to Cattell's trait of ego strength. Conscientiousness describes the extent of our organisation and persistence. Highly conscientious individuals are disciplined, punctual and ambitious.

Costa & McCrae (1985) developed a personality test known as the NEO-PI, an acronym which stands for the Neuroticism, Extroversion and Openness Personality Inventory. The first version just measured these three traits, and the name stuck when agreeableness and conscientiousness were added. The NEO-PI includes 181 statements to which respondents indicate their agreement on a 5-point scale ranging from 'strongly agree' to 'strongly disagree'.

There has been a large volume of research into the relationship between personality traits, as measured by the EPI/EPQ, the 16PF and the NEO-PI, and sporting behaviour. Attempts have been made to distinguish athletes from non-athletes and successful performers from less successful performers. Sport psychologists have also looked at whether personality factors are associated with choice of sport. Distinguishing athletes from non-athletes. Numerous attempts have been made to find out whether there is a fundamental difference between the personalities of athletes and nonathletes. Eysenck (1982) proposed that people scoring high on the extroversion and psychoticism scales of the EPQ are more likely to take up sport. Some though by no means all research has supported this hypothesis. Schurr et al (1977) tested 1500 American students with the 16PF, relating this to participation in sport, choice of sport and level of success.

They found that athletes (defined as those in university teams) differed from non-athletes on three scales of the 16PF, being more independent and objective, and less anxious than the non-athletes.

Personality and choice of sport

Personality and sport has proved a rather more fruitful area of study, and some important differences between the personalities of successful athletes in different sports have emerged. This is perhaps unsurprising when we consider the varying demands of different sports. In the Schurr et al (1977) study, although relatively few differences emerged between athletes and non-athletes, considerable differences were found between team and individual players. Team players emerged as more anxious and extrovert than individual competitors.

Another important distinction has emerged between the personalities of those taking part in high- and low-risk sports. Breivik (1996) administered the 16PF to 38 elite Norwegian climbers and found a distinctive profile characterised by very high levels of stability, extraversion and adventure seeking. In another study, Freixanet (1999) administrated the EPQ to a range of high-risk sports participants, including 72 mountaineers, and a control group of low-risk athletes.

The mountaineers and other high-risk athletes were characterised by significantly higher levels of extraversion and low levels of neuroticism. Other high-risk sports have also attracted attention. Using the NEO-PI, Diehm & Armatas (2004) compared the personality of 44 golfers (low-risk) and 41 surfers (high-risk). Surfers emerged as significantly higher on the openness scale, meaning that they were more open to new experiences .

Narrow-band theories of personality Trait theories proper aim to be comprehensive accounts of personality, seeking to explain all variations in individual behaviour. However, in addition to these rather grand theories, there are a number of more modest theories that focus on specific aspects of personality. We call these narrow-band theories. Three narrow-band approaches to

personality are worth a particularly close look: sensation-seeking, telic dominance and mental toughness.

Sensation seeking

Zuckerman (1978) identified sensation seeking as an aspect of personality. Sensation seeking reflects the amount of stimulation a person will seek. Zuckerman (1978) identified four separate factors that make up sensation seeking, namely seeking of thrills and adventure, differences can you see between golfers and surfers?

Studies have found that sensation seeking, as measured by Zuckerman's scale, is positively related to drug-taking, sexual experimentation, public drunkenness and volunteering for high-risk activities. Clearly, the last is of interest to sport psychologists, who are interested in who chooses to participate in risky sports. In

one study, Jack & Ronan (1998) assessed 166 athletes from both high-risk sports, such as hang-gliding, mountaineering and motor racing, and low-risk activities such as aerobics and golf, using Zuckerman's sensation-seeking scale. High scores on the Zuckerman scale were associated with participation in high-risk sports.

Mental toughness

The term 'mental toughness' has been used for some time by athletes and commentators, but has only very recently become a focus of attention for sport psychologists. It has been defined in a range of ways, but a common thread in all these definitions seems to be the ability to cope with difficult circumstances. This manifests in a range of qualities, including coping with pressure of competition, coming back after failure, determination and resilience (Middleton et al, 2004). Jones et al (2002) carried out individual interviews and focus groups with international-level athletes in an attempt to clarify what the athletes saw as mental toughness. Interestingly, athletes framed mental toughness in *relativistic* terms, that is, in terms relative to other competitors: 'Mental toughness is having the natural or developed psychological edge that enables you to: 1. Generally cope better than your opponents with the many demands . . . that sport places on a performer; and 2) Specifically, be more consistent and better than your opponents in remaining determined, focused, confident, and in control under pressure' (p 209).

There have been a number of attempts to measure mental toughness by self-rating inventories. Establishing a valid measure has not been made easier by difficulties in arriving at a precise definition.

Clough et al (2002) have attempted to explain mental toughness as a set of coping skills that combine to make the individual *hardy*, that is, able to thrive under pressure. The concept of hardiness was developed in the field of health psychology by Kobasa (1979), whose aim was to explain why a minority of people do not appear to experience stress in circumstances that would be unhealthy for most of us.

Clough and colleagues identified four characteristics underlying hardiness:

• control; being able to keep emotions in check

• commitment; taking an active role in events

• challenge; a positive attitude to change

• confidence; self-belief.

Support for the importance of hardiness comes from a study by Golby et al (2003), in which 70 international rugby league players were assessed for mental toughness and hardiness by standard measures (the Psychological Performance Inventory and the Personal Views Survey, respectively). Hardiness emerged as a significant factor affecting performance. At the time of writing, however, there is little consensus about

how mental toughness should be defined and explained. Given the importance accorded to it by athletes, this is a source of frustration and represents a failure by the discipline of sport psychology.

Attentional style

Nideffer (1976) proposed that athletes' personality can be classified according to their individual information-processing characteristics. More specifically, he believed that our attention (the cognitive processes by which we focus and maintain focus on particular sources of information) can be measured in terms of two dimensions, width and direction.

• *Width* refers to our tendency to take in a broad range of information as opposed to focusing very narrowly on one source of information whilst tuning out other sources.

• *Direction* refers to *where* we tend to focus our attention, and varies from internal (our own mental and physical state) to external (what is happening around us).

Clearly, there are times when it is beneficial to focus narrowly and others when a wider focus is preferable. For example, tennis players must be able to focus narrowly on the ball but also use a broad focus o establish which way the opponent is moving – and hence to plan their next stroke. Similarly, it is sometimes important to focus on ourselves and other times more important to be able to focus on external events. For example, a rugby forward might maintain an internal focus in a scrum to be sure he was pushing effectively but an external focus to follow the direction of the ball. Effective attenders are those who can rapidly switch the direction and width of their attention and who do not easily become overloaded by information.

Effective attention is beneficial in all sports. However, success in some sports is particularly associated with a particular attentional skill. For example, karateka particularly value a broad external focus (called *zanshin*), which allows the fighter to detect an attack from any direction.

Attentional style is measured by means of a 144-item questionnaire, the Test of Attentional and Interpersonal Style (TAIS). This measures 17 dimensions of personality, of which six are concerned with attention. The following three scales measure positive aspects of attentional style:

• The broad external scale (BET) assesses the athlete's ability to focus on several external stimuli.

• The broad internal scale (BIT) assesses the ability to analyse information from several sources.

• The narrow focus (NAR) scale assesses the ability to focus narrowly on one stimulus.

We would expect high scores on these scales to be associated with good performance. The other three scales measure negative aspects of attentional style, and we would expect high scores to be associated with poor performance.

• The overload external (OET) scale assesses the athlete's tendency to become overloaded with external stimuli and make errors as a result.

• The overload internal (OIT) scale assesses the tendency to become confused when analysing too many sources of data simultaneously.

• The reduced focus (RED) scale assesses the tendency to maintain too narrow a focus.

Situational and interactional approaches

One of the problems with trait theories, and to some extent with narrow-band theories as well, is that they assume that the individual's behaviour is consistent across a variety of situations. This largely ignores the impact that the situation itself has on the person's response. Mischel (1968) put forward the situationalist approach. This was a radical theory that rejected entirely the idea of stable personality traits. Instead, Mischel proposed that people's responses to situations could be explained entirely by the specifics of the situation. Effectively, this is a rejection of the whole concept of personality.

Nowadays, virtually no psychologists would accept situationalism as a complete explanation of behaviour. Mischel (1990) has himself backtracked somewhat, whilst still maintaining the important point that the way individuals think, feel and act in different situations varies considerably more than we would expect if trait theory were entirely correct. The idea that our behaviour at any time is the product of an interaction between the situation and our personality is called the interactional view, first proposed by Bowers (1973).

Applying the interactional model to sport

The vignette in the reflective exercise above should illustrate the importance of situations. However, we can understand people's behaviour better if we look at how the situation interacts with their personality. You probably all know someone who is a friendly, jolly character who, in their social life, would not hurt a fly, yet, on the sports field seems almost uncontrollably aggressive. We cannot explain this person's actions by situation or personality alone. We know that they are not simply aggressive because their behaviour is not aggressive in other situations. We also know that competing on the sports field does not make the rest of us uncontrollably aggressive.

Therefore, this individual's aggression when taking part in sport must result from some complex interaction between their personality and the sporting situation. Cox (2001) has estimated the importance of various factors in sporting performance. Personality, situation and the interaction between personality and situation together account for less than half the variance in athletic performance.

Profiling moods

We know that, although we can produce profiles of athletes' personalities, this is not necessarily useful in predicting how well they will perform. However, the interactional model gives us another angle on profiling. Instead of trying to measure people's underlying personality traits, we can instead measure their mood at the time of performance. An athlete's mood at any one time is a product of both personality and

situation; therefore, it is a much more valid measure of their psychological state during performance. McNair et al (1972) developed the Profile of Mood States (POMS), a 65-item questionnaire that assesses individuals on six scales: tension, depression, anger, vigour, fatigue and confusion. The POMS was originally developed for assessing the state of psychiatric patients, but it quickly caught on in the field of sport psychology.

Morgan (1979) have produced the mood profile for elite athletes, by measuring them on each of the POMS scales. The flatter profile of the less successful athlete is also shown. Elite athletes score lower on most mood measures, notably on tension and depression, but higher on vigour. Numerous studies have shown that elite athletes from a variety of sports do tend to exhibit the iceberg profile. Thus, Bell & Howe (1988) found iceberg profiles in triathletes, and Gat & McWhirter (1998) found the same pattern in cyclists. Beedie et al (2000) carried out a meta-analysis of previous studies relating POMS to performance.

Meta-analysis is a statistical technique in which the results of previous studies are combined, weighting each study for sample size. In this case meta-analysis revealed that, taken across a range of sports, POMS profiles were fairly predictive of performance. Vigour, depression and confusion were particularly strongly associated with performance.

Chapter Two

Motivation and sport

One of the fundamental questions about human nature that psychologists need to answer is, 'Why do we do things?' We could simply answer, 'because I want to', 'because I need to', or even 'because I just do'. However, although all these statements are useful starting points, psychologists are not satisfied with these answers, and seek to uncover the reasons *underlying* our experiences of wanting to, needing to or 'just doing' things. In this chapter, we can examine some basic types of human motivation, theories about specific motivators and research findings concerning what motivates us to participate and succeed in sport. A useful starting point is to examine intrinsic and extrinsic motivation.

Intrinsic and extrinsic motivation

An important distinction in types of human motives is that between extrinsic and intrinsic motivation. *Extrinsic* motivation results from external rewards. *Intrinsic* motivation comes from within the person. Both extrinsic and intrinsic motives are important in sport, and sport psychologists can work with both extrinsic and intrinsic motives to improve the performance of the individual. Intrinsic motives for taking part in sport include excitement, fun, love of action and the chance to demonstrate and improve our skills – in short, all the reasons that we *enjoy* sport. Later in this chapter, we will discuss some techniques designed to increase intrinsic motivation. The reason these can be used so effectively to motivate athletes is that they directly affect our intrinsic motivation. Extrinsic motives can come in the form of trophies, prizes and less tangible rewards such as praise and status.

Although there has been an enormous amount of research into how motivation can be improved in those already participating in sport, rather fewer studies have examined what motivates people to choose to take up sport. Ashford et al (1993) interviewed 336 adults at a community sports centre in Leicester about why they participated in sport, and what they enjoyed about it. Four main motivations emerged, physical well-being, psychological well-being, improvement of performance and *assertive achievement*, the last meaning to accomplish personal challenges and to gain status. Age and gender significantly affected motivation. Older people were more motivated by psychological well-being than younger people. Men were more motivated by assertive achievement than women. These motives are all intrinsic rather than extrinsic, lending support to the idea that most people come to sport for reasons of intrinsic motivation.

Of course, children's motives for taking part in sport may be different from those of adults. Daley and O'Gara (1998) investigated the motives of 145 children in a British secondary school for taking part in non-compulsory sport, using a questionnaire called the Participation Motivation Inventory (PMI). As in the Ashford et al study, the motives for sport participation differed according to gender and age. Between 11 and 15 years, intrinsic factors were more important and extrinsic factors less so. Girls emerged as more motivated by team affiliation and achievement than boys.

Given that intrinsic motivation is so important, a key aim of research has been to identify influences on intrinsic motivation. One recent study by Amorose & Horn (2001) assessed 72 American athletes on their intrinsic motivation at the beginning and end of their first year of college-level participation. They were asked about how much time they spent on training, the nature of their coaching and whether they had sport scholarships. The behaviour of coaches had the strongest effect on intrinsic motivation. Students whose coaches spent more time on technical instruction tended to display significant increases in their intrinsic motivation during the year. By contrast, those whose coaches threw their weight about experienced a decline in intrinsic motivation.

The additive principle

Generally, we tend to come to sport motivated more by intrinsic than extrinsic factors. However, extrinsic motivators have been used in an attempt to boost intrinsic motivation. The *additive principle* states that athletes low in intrinsic motivation can have their motivation boosted by adding some extrinsic motivation. However, this common-sense approach has not been well supported by research. There are numerous case studies of athletes whose performance sharply declined as soon as they received lucrative contracts (Cox, 2001).

Psychologists are always a little wary of case studies as evidence, but there are other ways of investigating the additive principle. One approach is to compare the motivation of athletes competing for pleasure and those competing for other reasons. Fortier et al (1995) compared the intrinsic motivation levels of Canadian athletes who participated for recreation with those involved in collegiate competition. The collegiate athletes, who were highly focused on the goal of winning, showed less intrinsic motivation than those participating for pleasure. An alternative approach to researching the additive principle is to follow up athletes after changes in their circumstances. In one such study, Sturman & Thibodeau (2001) followed the progress of 33 US baseball professionals for two seasons before and two seasons after they signed new contracts that substantially increased their income. Although there were substantial individual differences, performance typically dropped off after signing the contract.

One way in which extrinsic motivators can be used successfully to boost intrinsic motivation is in the grading systems of the Eastern martial arts, usually symbolised by a coloured belt or sash. Contrary to popular belief, such belts are not an ancient tradition, but a relatively recent innovation in the martial arts. They are designed to provide regular tangible rewards for students' achievements, with the aim of motivating them to continue.

Theories of motivation

Maslow's theory of needs

Maslow (1954) developed a theory of human motivation that aimed to explain all the types of human need and rank them in the order people seek to satisfy them. The idea behind the hierarchy of needs is that we ascend the hierarchy, satisfying each motive in turn. Our first priority is to satisfy our *physiological needs*, such as food and warmth, because we cannot live without these. Only when these needs have been satisfied do we seek out *safety*. Once we are safe, the next thing we need to worry about is our *social needs*, that is, to belong to a group and have relationships with others. When our social needs are satisfied, *esteem needs* become paramount. To satisfy them, we need to

achieve, to become competent and to be recognised as so. Once this has been achieved, our focus will shift to satisfying our *intellectual needs*, which include understanding and knowledge.

Next in Maslow's hierarchy above intellectual needs come *aesthetic needs*, that is, the need for beauty, order and balance. The final human need identified by Maslow is for *self-actualisation*, that is, to find personal fulfillment and achieve one's potential. According to Maslow, we are all striving to ascend the hierarchy of needs, but very few of us achieve self-actualisation. Sport, however, does provide a possible path to self-actualisation. Athletes who rise to the very top of their field, holding world records and championship titles, could be said to be self-actualised in that they have fulfilled their dreams and their potential. On the other hand, we should be careful not to equate self-actualization with success. There are numerous sporting celebrities who, despite rising to the top of their chosen sport and appearing to fulfill their potential, have clearly not found personal fulfillment and have, by contrast, 'gone off the rails'.

Maslow's theory has been enormously influential. Most importantly, he has opened our eyes to the *range* of human needs. If you have carried out the exercise above, you have probably seen that you have multiple reasons for participating in sport, and that your reasons are grouped above the physiological and safety needs. If you are motivated principally by physiological and safety needs (say, for example, if you are homeless and starving), it is unlikely that you would be able to raise much motivation to take part in sport. Sport is an excellent way of providing us with esteem and social needs. For some, it may also provide a path to self-actualization.

Despite the usefulness of Maslow's work, his prediction that we are all motivated by these needs and that everybody seeks to satisfy them in the same order is suspect, particularly when we look at elite athletes who have put success ahead of other considerations. Saul (1993) has pointed out that 65% of ballet dancers have chronic injuries and suggested that they have sacrificed physiological needs in pursuit of aesthetic needs. This is perhaps an extreme example, but it illustrates that sometimes aiming for higher needs means not satisfying the more basic needs – contrary to Maslow's theory.

Achievement Motivation

The link between the wish to achieve and sporting success is an obvious one. A strong wish to succeed in your chosen sport will be a huge asset in determining how hard you train and how hard you try in competition. All participation in sport involves achievement, regardless of whether you regard competition as important. You are in fact probably more likely to boost your performance by setting yourself goals of personal achievement, such as 80% of first serves in, 90% of penalties in the net, rather than goals of victory (see section on goal setting in Chapter 4). Some psychologists see the drive to achieve as innate, whereas others see it as acquired by experience. Some believe that the most important factor is to achieve success, whereas others emphazise the motive of avoiding failure. The most influential theory of achievement motivation comes from McClelland et al (1953) and Atkinson (1964).

The McClelland–Atkinson theory of need achievement

The aim of the McClelland–Atkinson theory was to explain why some individuals are more motivated to achieve than others. The athlete's intrinsic motivation is seen as the motive to achieve. Acting against this intrinsic motivation, however, is the motive to avoid failure. When faced with a task such as sport, we face an *approach–avoidance conflict*. We are motivated to approach and take part by our desire to succeed, but we are also motivated to avoid taking part by our desire to avoid failure. Our individual decision to participate in sport is determined by the relative strength of these two factors. This is shown in the following equation: achievement motivation = desire to succeed – fear of failure.

To McClelland and Atkinson, achievement motivation is a personality trait. For some of us, the desire to succeed far outweighs the fear of failure, and we are said to be high in achievement motivation. For others, the fear of failure is the more important factor, and they would be said to be low in achievement motivation. This personality trait is not the only factor that affects motivation. The situation is also important, specifically the *probability of success* and the *incentive for success*. Thus, even if athletes are low in achievement motivation, if the probability of success is high, and the rewards for success are great, they are likely to be motivated.

Gill (2000) reviewed research on choice of high- and low-difficulty tasks and concluded that there is much support for the prediction by the theory that high achievers seek out difficult tasks and low achievers prefer easier tasks. However, the theory does not reliably predict sporting *performance*. Of course, this does not mean that the theory is worthless. As Cox (2001) says, the value of measuring achievement motivation is not to predict performance, but to predict long-term patterns of motivation.

Achievement orientations

The most influential and researched approach to motivation in sport psychology, as well as in other arenas such as educational psychology, is Nicholls' (1984) theory of goal or achievement orientations. Nicholls makes the important distinction between two styles of achievement motivation, task orientation and ego orientation. These appear during different stages of psychological development. They result from the ways in which athletes explain their perceived ability.

Task orientation appears at 2–6 years of age. Children at this stage tend to judge their sporting competence on the basis of how well they performed the task at the last attempt. Crucially, their judgements of their performance are strongly influenced by their effort; that is, if they try hard, they think they have done well. However, a change takes place in the way children come to view their sporting competence at around 6 years. *Ego-oriented* children base their judgement of their competence on their success relative to their peers. As adults, we have access to information about both our past performances and the performances of others to judge our competence. Task and ego orientations are not mutually exclusive and can exist in the same person. However, some athletes prefer to rely on past performance whilst others prefer to look at performance relative to others. Athletes can be classified as *task-oriented* or *ego-oriented* according to these preferences.

Both task and ego motives can be helpful to the athlete. However, a task orientation has the advantage of greater persistence in the face of adversity. One way in which sport psychologists can enhance athletic motivation is to help athletes develop a healthy blend of task and ego orientations. In a recent study of golfers, Steinberg et al (2001) compared the progress of 72 novice golfers who were assigned to one of four training conditions. In the first condition, training focused purely on competition; in the second, it was based purely on task mastery; in the third, there was a balance between mastery and competition; and in the fourth, there was no systematic orientation toward tasks or competition. After 6 weeks, only the group with combined training orientations had significantly improved their performance.

Mastery and performance environments

Particular environments seem to foster task and ego orientations. A *mastery environment* can be defined as one in which there is a focus on the mastery of skills. This is associated with promotion of a task orientation. By contrast, the emphasis in a *performance environment* is on comparison of the individual abilities. In training, the latter can disadvantage low-ability participants, who simply experience the humiliation of comparison with more skilled athletes in response to their efforts. It is widely agreed that a task-oriented training environment is preferable to an ego-oriented environment (European Federation of Sport Psychology, 1996). Ames (1992) has suggested the TARGET system for ensuring that a training environment is task oriented.

An interesting contrast is that between the environments in which martial arts are practised. Wing chun is taught in an extremely taskoriented environment with close attention to perfecting technique and without competition. By contrast, the emphasis in tae kwondo is very much on competition. There is a similar division amongst the grappling styles. Gernigon & Le Bars (2000) compared achievement orientation in French practitioners of judo and aikido, the former being more of a competitive sport and the latter a highly traditional art. Task orientation was greater in aikidoka whilst ego orientation was dominant in judoka.

The disparity was wider in more experienced practitioners. Of course, once we are in competition, our environment is inevitably oriented to performance, and this appears to affect the orientation of competitors. TARGET approach to creating a mastery environment :

- Tasks: a variety of challenging tasks in which players set process goals.
- Authority: players play an active role in decision making.
- Recognition: recognise individual progress.
- Grouping: use mixed-ability groups.
- Evaluation: evaluation should be based on personal progress and should be by self and peers.
- Time: allow time for practice of technique as well as competition.

Norwegian women's soccer team throughout the 1996 Olympic Games. As we might expect, given the emphasis on medals at the Olympics, task orientation declined and ego orientation increased throughout the games.

Attribution theory

Because we have a desire to understand the world around us, we have a powerful tendency to make *attributions* about the causes of events and behaviour. This means that we come to a conclusion about *why* something happened or *why* someone behaved or performed in a certain way. We make attributions about our own behaviour and about the behaviour of those around us, *whether or not we have the evidence to arrive at accurate conclusions*. In this chapter, we are chiefly concerned with the attributions we make about ourselves.

Internal and external attributions

Broadly, we can make two types of attribution, *internal* and *external*. Internal attributions place the responsibility for behaviour or performance with the individual, whereas external attributions place the reasons in the situation. Consider the following example. A college rugby team has just returned home after their first match, having lost 72–0. They have the unenviable task of explaining the score to others.

They make a number of internal or external attributions to explain why they lost so badly. Examples of these attributions are shown in Table 8.2 shows various attempts to make sense of the catastrophic result. The players adopting the internal attributions are blaming themselves, whereas those adopting the external attributions are blaming other characteristics of the situation. As you can imagine, after a humiliating defeat, most of us would tend to adopt external attributions and blame other factors, whereas after a success most of us tend to adopt an internal position and take the credit. This phenomenon is known as *self-serving bias*.

Whether we make internal or external attributions appears to be related to self-esteem; hence, this can affect performance. Biddle and Hill (1992) conducted a study in which 58 sixth-form and university students fenced, all for the first time. The outcome of each match was manipulated by the experimenters so that some participants consistently won and others consistently lost. After a series of matches, the attributions and emotional states of the participants were measured. Statistical analysis of the results showed that the attributions made by the students to explain the results were strongly related to the emotions they experienced, particularly in those participants who consistently lost. This shows that the main predictor of self-esteem in losers is the perception of why they lost.

Weiner's model of attribution

Weiner (1992) produced a model of self-attribution based on two factors, whether an internal or external attribution is made, and whether this attribution is stable over time or varies from one situation to another.

If we consistently succeed or fail, our attributions are likely to be stable. This means that we are likely to attribute the outcome to either our ability or the difficulty of the task. Because of self-serving bias, it is more likely that we will attribute success to ability and failure to task difficulty. If our results are less consistent, we will probably attribute them to effort or luck. Again, self-serving bias means that we are likely to attribute success to effort and failure to bad luck.

Weiner's model gives us a starting point to work with athletes to correct their attributions. We may wish to shift the attributions of lazy athletes toward the unstable-internal position so that they realize more effort is needed. We may also wish to shift the attributions of depressed athletes away from a stable-internal position, so that they cease to blame their lack of ability. This is examined further below when we look at the idea of learned helplessness. Altering an athlete's attributional state is called reattribution training, and is a form of cognitive therapy. An example of the use of attributional therapy comes from Orbach et al (1999), who investigated the effectiveness of attribution training with 35 inexperienced tennis players. They were given false feedback over four training sessions, in order to lead them to attribute successes to internal factors. As hoped, the players changed their attributions in response to the feedback, and these changes led to improved self-esteem and performance.

Self-efficacy

The term 'self-esteem' has already come up in this chapter, appearing to be important in the link between attributions and performance. Bandura (1982) has introduced the related but distinct concept of S*elfefficacy*. Self-esteem refers to how we *feel* about ourselves, and it is generally stable across a range of situations. Self-efficacy, by contrast, refers to what we *believe* about our abilities. Unlike self-esteem, selfefficacy is situation specific. For example, if you are a natural athlete, but have some difficulty in getting to grips with sport psychology, your self-efficacy will probably be considerably greater on the field than in the classroom. Schunk (1991) has suggested four sources of information that we draw upon in order to arrive at our academic selfefficacy.

Influences on self-efficacy

• **Previous experience**: athletes who have previously succeeded in particular tasks will generally tend to have higher self-efficacy for related tasks.

• **Direct persuasion**: poor self-efficacy beliefs are open to challenge. A persuasive coach can convince athletes of their ability to carry out tasks.

• **Observational learning**: we tend to pick up on the self-efficacy of fellow athletes. When peers of previously comparable ability or success express their positive beliefs about their ability to perform a task, this suggests that we should also be capable of doing so.

• **Physiological cues**: we constantly experience our physiological state and use this as a source of information about our current emotional state. If, for example, we notice the signs of anxiety while carrying out a task, we may attribute this to personal difficulty with the task, leading to reduced self efficacy.

If, on the other hand, we are relaxed while doing something, we may interpret this in terms of the ease with which that task comes to us. Self-efficacy can exert a powerful effect on performance. As Bandura (1990) put it, 'once extraordinary performances are shown to be doable, they become commonplace' (p 29). Bandura proposed that self-efficacy could be boosted by successful performance, verbal persuasion and feedback about performance. Wells et al (1993) set out to test whether self-efficacy could be affected by feedback, and whether changes in self-efficacy could affect performance on a weightlifting task. Three groups of students were randomly assigned to three groups.

Two of the groups were misled about the weight they were successfully lifting. One group, termed the 'light group', lifted less weight than they believed. A 'heavy group' lifted more than they believed. The third group received accurate information about how much they were lifting. The 'light group', who had received false feedback designed to boost their self-efficacy, were able, in a later trial, to lift more than they had originally. This finding underlines the importance of giving positive feedback to athletes – even if you exaggerate a little about how well they are doing! There is little doubt that self-efficacy is a valid construct. It can be measured, and studies such as that by Wells et al (1993) have demonstrated that it can be manipulated, as predicted by Bandura, in order to improve performance. For a coach or teacher, self-efficacy is a useful idea to bear in mind during training. It is, however, a weaker predictor of success than previous performance. Krane et al (1996) looked at self-efficacy in wrestlers, and found that it was most important as a predictor of victory when competitors were evenly matched. Like other psychological factors, self-efficacy may make all the difference at very high levels, when competitors are probably physically well matched.

Counterfactual thinking

Sometimes our attributions about sporting successes and failures can be quite unrealistic. This type of thinking is called *counterfactual thinking* (CFT) because it runs counter to the facts of the situation. On occasion, our general tendency to make attributions about the causes of events can lead us to think about past events, over which we no longer have any control. Thus, athletes who have underachieved can waste time 'torturing' themselves about what might have happened had they approached things differently or not made an error. This is called *upward* CFT. The opposite phenomenon also occurs, and we might indulge in thinking excessively about how much worse things might have been. This is called *downward* CFT.

CFT tends to occur when an outcome is negative, unexpected and upsetting, particularly when the result constitutes a near miss. Wolfson (2002) discusses the example of the 1998 World Cup quarterfinal, when David Beckham was famously dismissed for kicking out at an Argentinian player after an aggressive tackle. The England team was by no means certain to win had Beckham remained on the pitch; however, England's loss was almost universally attributed to his actions, and the UK press and public engaged in an 'orgy' of CFT, focusing on the likely outcome of the championship had the incident not taken place. Interestingly, had England been clearly losing at the time, probably little attention would have been given to Beckham's action – this illustrates the importance of the near miss in activating

CFT.

Both upward and downward CFT can lead to positive and negative consequences. Upward CFT can be a depressing experience if it just leads us to relive unhappy and humiliating experiences. However, it can also be helpful in pointing us in the direction of improvement. Thus, a batsman who takes a thrashing from a bowler using a high bounce might feel humiliated and dwell on this, thinking about what might have happened if he had survived the

over (an example of upward CFT) or what might have happened if the ball had hit him and damaged his brain (an example of downward CFT). However, if it leads him to work on his defence, it may improve his performance in the long run.

Downward CFT has a defensive function, and may make us feel better after something has gone wrong; for example, a footballer who breaks an ankle after a tackle might comfort himself with the thought that if the tackle had been higher there might have had serious knee damage ending his career altogether. However, there is a risk that downward CFT can lead to complacency. Thus, the martial artist who scrapes through a brown belt grading and then dwells on this achievement, ignoring the nearness of failure and the harder task of gaining a black belt, is likely to lose the necessary motivation to continue training hard (this is known as the 'brown belt blues'). Martial arts instructors often introduce new challenges and work students particularly hard after a grading in order to avoid this.

CHAPTER THREE
Arousal, Anxiety, Stress and Sport Performance

Common sense tells us that there are important links between sport and arousal, anxiety and stress. Sport normally involves competition, which in turn tends to induce anxiety, characterised by an increase in arousal. You may have had the experience of performing better than you expected when anxious, or, alternatively, you might have had the less fortunate experience of making mistakes under pressure. Sport psychologists have been concerned with understanding what factors affect arousal, anxiety and stress; how these affect athletic performance; and how we can learn to regulate our arousal and anxiety in order to improve our performance. As Jones (1991) has pointed out, at the top sporting levels (at least in many sports), there is very little difference in the skill levels of the participants. It is thus often thebability to handle anxiety and stress that separates the winner and loser. Before going any further, it is important to understand exactly what psychologists mean by the terms 'arousal', 'anxiety' and 'stress'.

Definitions of arousal, anxiety and stress

Arousal may be defined as 'a general physiological and psychological activation varying on a continuum from deep sleep to intense excitement' (Gould & Krane, 1992). When we are bored, relaxed or asleep, we are in a state of low arousal. When excited, angry or anxious, we are in a state of high arousal. You can see from this that being in a state of high or low arousal is not *in itself* necessarily a pleasant or unpleasant experience.

On the other hand, *anxiety* is by definition an unpleasant sensation. Weinberg & Gould (1995) have offered the following definition of anxiety: 'a negative emotional state with feelings of nervousness, worry and apprehension associated with activation or arousal of the body' (p 264). We can thus think of anxiety as an unpleasant state of high arousal.

The term *stress* has a broader meaning than anxiety. Stress is the process whereby an individual perceives a threat and responds with a series of psychological and physiological changes, including

increased arousal and the experience of anxiety. We tend to experience stress when we meet demands that are difficult to meet, but which carry serious consequences if we fail to meet them. If stress is longterm, or *chronic*, it can cause serious harm to both physical and mental health. Whilst it is quite normal – and as we shall see quite beneficial – to experience some anxiety before competing, athletes should not feel constantly anxious and see themselves as facing insurmountable odds.

Cognitive and somatic anxiety

Martens et al (1990) distinguished between two aspects of anxiety. When we are anxious, we experience the physiological changes associated with high arousal, including increased heart rate and blood pressure, 'butterflies' in the stomach, faster breathing and flushed face. These effects are similar (though not identical) to the physiological effects of excitement and anger. We call the experience of physiological changes associated with anxiety *somatic anxiety* (from the Greek *soma* meaning body). We can measure somatic anxiety directly by physiological means, or indirectly by self-rating inventories. Direct physiological measures include urinalysis, galvanic skin response (GSR) and blood pressure testing. Elevated levels of certain hormones released when we are anxious (such as adrenalin) can be detected in urine. We also tend to sweat more when anxious. This can be detected by a GSR meter, which measures the electrical conductivity of the skin – the more we sweat, the better conductor our skin becomes. Our blood pressure also increases when we are anxious, and this can be measured by a sphygmomanometer. There are two major problems with these physiological measures of anxiety. Firstly, as we vary quite a lot in our normal physiological levels, all individuals studied would have to have physiological measures taken over time to establish their levels with and without anxiety. Secondly, physiological measures require laboratory equipment and are difficult to administer in the field. Self rating inventories can be used to measure somatic anxiety indirectly.

We shall examine two such questionnaires, the SCAT and the CSAI–2, later in this chapter. At the same time as we experience somatic anxiety, we may also experience *cognitive anxiety*. Cognitive anxiety refers to the anxious thoughts that accompany somatic anxiety. Anxious thinking involves worries, self-doubts and images of losing and humiliation. A number of studies have examined how cognitive anxiety and somatic anxiety change before a sporting event. Swain & Jones (1993) followed 49 field and track athletes, measuring both the frequency and intensity of their cognitive and somatic anxiety on four occasions (2 days, 1 day, 2 hours and 30 minutes) prior to an important competition. They found that both cognitive and somatic anxiety increased before the event, the most dramatic increase being in the frequency of anxious thinking immediately before competition.

Once competition begins, it is commonly believed that somatic anxiety declines sharply, whilst cognitive anxiety fluctuates, depending on how the event is going. Therefore, many researchers have proposed that errors during performance are due to cognitive anxiety, and not somatic anxiety. Cox (1998) proposed that cognitive anxiety is negatively related to performance – as cognitive anxiety increases, performance declines. However, in the Swain & Jones (1993) study, several athletes reported that they needed a degree of cognitive anxiety in order to perform well. Since it is very difficult to measure cognitive anxiety *during* sport, we can estimate the frequency and intensity of anxious thinking only whilst athletes are performing. Of course, it is important to consider the demands of different sports. Hanton et al (2000) examined self-reported cognitive and somatic anxiety in 50 rugby league players and 50 target rifle shooters.

There were no differences in the extent of anxiety between the two groups of athletes or between their perceptions of the effect of cognitive anxiety on performance. However, rugby players were more likely to report that somatic anxiety had a positive impact on their performance, and shooters were more likely to say it had a negative impact. Studies like these are important because they show that it is important to make a distinction between somatic and cognitive anxiety. Later in this chapter, the relationships between cognitive and somatic anxiety and performance are examined in some detail.

State and trait anxiety

Another important distinction was made by Spielberger (1966) between state and trait anxiety. *Trait anxiety* refers to anxiety as an aspect of personality. A person high in trait anxiety will be frequently anxious, almost irrespective of the situation. Recall Chapter 1 in which we looked at Hans Eysenck's trait theory of personality. Eysenck believed that some people are generally more anxious and moody than others because they are genetically programmed to react more to potential threats in their environment. Martens et al (1977) developed a self-rating inventory called the Sport Competition Anxiety Test (SCAT), designed to measure trait anxiety related to sport.

State anxiety refers to the emotional state of anxiety (cognitive and somatic), typically experienced prior to and during competition. Martens et al (1990) have produced an updated questionnaire, the Competitive State Anxiety Inventory–2 (CSAI–2), based on the SCAT, which seeks to measure state anxiety before competition. During the 1990s, the CSAI–2 became the most widely accepted research tool for measuring competitive anxiety. It includes three subscales measuring cognitive anxiety (e.g. items 1 and 3), somatic anxiety (e.g. items 2 and 5) and self-confidence (e.g. item 4). The Swain & Jones (1993) study discussed earlier in the chapter used the CSAI–2 as the measure of pre-competitive anxiety. However, the CSAI–2 has recently been criticised, both for its phrasing and for its usefulness. Some items (such as item 1 above) use the word 'concerned'. It is likely that all athletes are concerned about imminent competitions, so the answers probably do not tell us much about the athlete's anxiety.

Collins (1998) has launched a particularly vigorous attack on research using the CSAI–2, saying that it is not a good predictor of performance and that it tells us little about the processes involved in the relationship between anxiety and performance. A meta-analysis of 29 studies linking CSAI–2 scores to performance (Craft et al, 2003) found only weak correlations between items measuring cognitive anxiety, somatic anxiety and self-confidence, suggesting that it is a conceptual error to combine them in a measure of state anxiety.

Factors inducing anxiety and stress

How anxious we feel at any time is a product of both our individual psychological make-up and the characteristics of the situation we find ourselves in. Therefore, when looking at why someone is anxious, we need to take into account both situational and individual factors.

Situational factors

Event importance

The more important a sporting event is, the more stressful we are likely to find it. It is probably true to say, for example, that most footballers would find themselves more anxious competing in the World Cup than in a 'friendly'. However, we must remember that it is the importance of the event *to the individual* that counts. This does not necessarily depend on the status of the competition. For example, athletes who know they are being watched by talent scouts, or perhaps by their family for the first time, may feel particularly anxious.

Marchant et al (1998) carried out an experiment in which event importance was artificially set up. Pairs of golfers competed for either three new balls (low importance) or a new pair of golfing shoes (high importance). As expected, those competing for the new shoes experienced more anxiety than those competing for golf balls.

Expectations

It seems likely that both high and low expectations can be linked to anxiety. In the 2004 European Championships, it was said by many that England had to cope with very high expectations that they would win. It seems likely that in the end this contributed to their downfall. By contrast the winners, Greece, as first-time qualifiers, had far less pressure on them to succeed. Individuals as well as teams can be adversely affected by the pressure of high expectations. Too much pressure from teachers, coaches and family can add tremendously to competitive anxiety. Of course, the opposite can also hold true. Hall & Kerr (1998) studied 111 fencers, assessing anxiety and ability beliefs.

There was a strong relationship between ability beliefs and anxiety, those with low expectations of their performance experiencing more anxiety.

Individual factors

Trait anxiety

Some people are prone to suffer more anxiety than others, whatever the situation. This can be explained by genetics (see Eysenck's theory, Chapter 2), but also by experience. Social learning theorists might explain trait anxiety as having been learned from adults in childhood. The psychodynamic view emphasises the importance of early family relationships, and the fact that those who experience early trauma or family disruption may afterward suffer chronic anxiety. Individuals

high in trait anxiety are likely to see competition as particularly stressful.

In the Marchant et al (1998) study of anxiety in golfers (see above), trait anxiety, as well as event importance, was a significant predictor of state anxiety.

Performance concerns

One way in which we vary as athletes is the manner in which we are concerned about our performance. Of course, it is essential for our motivation that we show some concern in this direction; however, too much in the way of perfectionism or concern over our image as opposed to our achievement is associated with high anxiety. Hall et al (1998) found that high levels of perfectionism were associated with cognitive anxiety in secondary school runners. Wilson & Eklund

(1998) examined the importance of self-presentational concern in 199 American university-level athletes, who were assessed for somatic and cognitive anxiety and their concerns over their image. Concerns over appearing untalented, non-composed, fatigued and unattractive were all related to cognitive, though not somatic anxiety.

Locus of control

Locus of control describes the extent to which we believe that we are in control of our lives. The concept was developed by Rotter (1966). Research in a number of contexts has found that individuals low in locus of control are generally more vulnerable to anxiety and stress. There is a range of psychometric tests available to assess locus of control. Items from one such test are shown in Box 7.3. Ntoumanis & Jones (1998) investigated the relationship between locus of control and competitive anxiety in 83 university- and county-level athletes (45 men, 38 women), using the CSAI–2 and a standard measure of locus of control. Interestingly, locus of control was not associated

with somatic or cognitive anxiety levels; however, there was a relationship with how the athletes saw anxiety. Those with an internal locus saw anxiety as *facilitative*, that is, likely to improve their performance, whereas those with an external locus of control tended to see it as *debilitative*, that is, bad for their performance.

The relationship between arousal and performance

Drive theory

Drive theory was proposed by Hull (1943). The theory itself is complex, but its application to sporting performance is relatively simple.

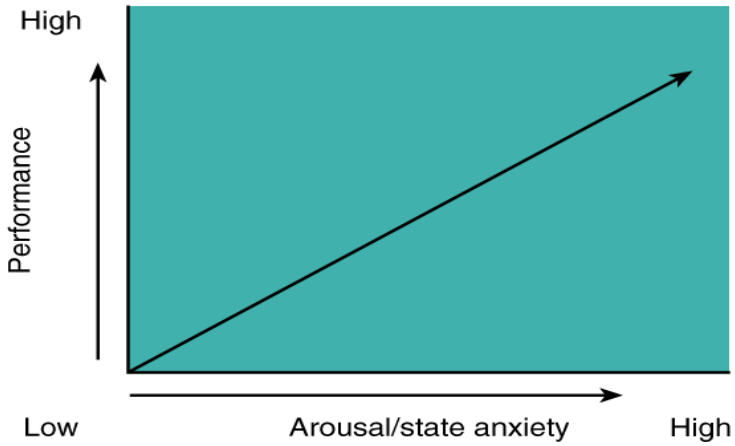

Figure 7.1 Drive theory of the relationship between arousal and performance for expert performers.

According to drive theory, three factors influence performance: complexity of task, arousal and learned habits. The greater the arousal, the more likely we are to adopt the dominant response to a situation, that is, our habit. Provided the task is *a simple one* and our dominant response is *the correct one*, the higher is our arousal, the better will be our performance; that is, performance = arousal × habit.

If, however, the task is a complex one or the dominant response is not correct, arousal will inhibit performance. Because arousal level is greater in competition than in practice, and increases according to the importance of the competition, drive theory predicts that the best performances take place in high-importance competition. Drive theory also predicts, however, that, because expert performers are likely to have correct habits and novices bad habits, novices are more likely to make mistakes under pressure. Empirical support for this idea can be found in Chapter 6, which deals with audience effects (see p 98). An important application of this principle is that if novices are to acquire better skills, they need to practise under conditions of low arousal, that is, with minimal spectators and minimal competition.

Drive theory has proved extremely useful in explaining why experts do better in competition and novices are more likely to crack under pressure. It has also given us an insight into how to optimise

athletes' arousal during training. However, drive theory fails to explain instances where even expert athletes become *too* aroused and make errors. It also fails to take account of the *type* of arousal experienced or psychological factors that may accompany arousal, such as cognitive anxiety.

Inverted-U hypothesis

By the 1970s, psychologists were dissatisfied with drive theory and had turned to the inverted-U approach to explain the relationship between arousal and performance. The inverted-U hypothesis was originated by Yerkes & Dodson (1908). The idea is that for every task here is an optimum level of arousal. Performance peaks at this level and drops off above and below it.

The optimum level of arousal for a task depends on the complexity of the skill required to carry out that task. For a complex task involving fine motor skills, such as potting a ball in snooker, low levels of arousal are prefer- is much higher. Support for the inverted-U hypothesis comes from athletes' reports of what factors they believe affect their performance.

Thelwell & Maynard (2000) questioned 198 county-level English cricketers about what they considered to be the most important variables affecting their performance. Optimum level of arousal

emerged in the top four factors affecting both batsmen and bowlers (the others being self-confidence, a pre-match routine and following a performance plan).

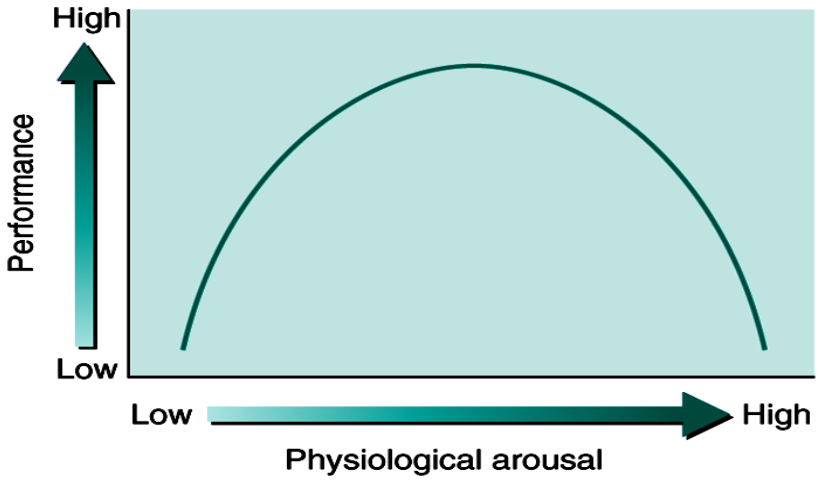

Figure 7.2 For gross tasks such as weightlifting, the optimum arousal level inverted-U hypothesis of arousal and performance.

Like drive theory, the inverted-U hypothesis has important applications in sport psychology. By looking at how fine the motor skills required for a particular sport are, we can then seek to optimise the arousal levels of competitors in that sport. Thus, we may recommend relaxation procedures to lower the arousal levels of darts and snooker players whilst recommending 'psyching up' exercises for weightlifters and rugby players. Unlike drive theory, the inverted-U hypothesis can easily explain why expert performers sometimes make errors under pressure. However, like drive theory, the inverted-U hypothesis fails to take account of the nature of the arousal or the effects of psychological factors, such as cognitive anxiety, on performance.

The relationship between anxiety and performance

In recent years, the emphasis in sport psychology has shifted away from study of simple arousal in favour of looking at the more complex phenomena of anxiety. There are three particularly influential theories seeking to explain the relationship between anxiety and sporting performance: the catastrophe model, zones of optimal functioning and reversal theory.

The catastrophe model

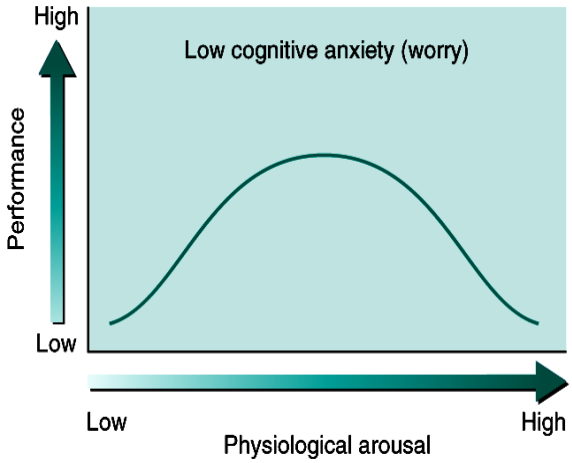

Figure 7.3 Fazey &Hardy's catastrophe model of the relationship between anxiety and performance.

Fazey & Hardy (1988) rejected the assumption of the inverted-U hypothesis that a small change in arousal will bring about a small change in performance. Instead, they pointed out that when athletes

are experiencing high cognitive anxiety (that is, they are worried), a small increase in arousal beyond the optimum level can cause a massive fall in performance. Figure 7.3 shows the relationship between arousal and performance under conditions of low and high cognitive anxiety.

Under conditions of low cognitive anxiety, that is, when the athlete is not particularly worried, the inverted-U hypothesis holds true. However, when cognitive anxiety is high, there comes a point just

above the optimum level of arousal where performance drops off sharply. This represents a performance catastrophe. The catastrophe model has proved difficult to test directly. However, a study by Hardy et al (1994) does support the idea that athletes' best and worst performances occur under conditions of high cognitive anxiety, and that under high cognitive anxiety performance drops off quickly after the optimum arousal level. Eight experienced crowngreen bowlers were asked to bowl three balls at a jack on two consecutive days. On one day, before bowling, they were given neutral instructions designed to create low cognitive anxiety, and on the other day they were given 'threatening' instructions designed to raise their cognitive anxiety. The CSAI–2 was administered to confirm that cognitive anxiety was indeed higher after the 'threatening' instructions.

To increase physiological arousal, the participants were given shuttle runs to perform and their heart rates were monitored. It is clear from Figure 7.2 that under conditions of low cognitive anxiety the results showed a weak inverted U, whereas under high cognitive anxiety performance peaked considerably higher but then dropped off quickly. This supports the catastrophe model. The catastrophe model is more complex than the inverted-U hypothesis and offers a more sophisticated understanding of the relationship between arousal and performance. The major practical application of the model is in showing that cognitive anxiety is not necessarily an enemy

of performance, but under certain circumstances is beneficial (Hardy 1996). This fits in with the results of interviews by Jones et al (1993), who found that many athletes reported that they performed best when worried. There has, however, been criticism of the model. Gill (1992) has suggested that it is essentially too complex to be entirely testable.

Zones of optimal functioning

Hanin (1986) criticised other theories of the relationship between anxiety and performance on the basis that they underemphasised individual differences in our responses to anxiety. When Hanin measured the pre-competitive anxiety scores of 46 elite female rowers (Hanin, 1986), he found a very wide variety of scores (mean score 44, range 26– 67). Given the comparable success of these athletes, this variety of anxiety levels suggested that there was a variety of different responses to anxiety. Instead of proposing a general relationship between anxiety and performance, Hanin suggested that each athlete has their own preferred level of anxiety and that their performance would suffer if their anxiety went below or above their preferred level. The athlete's preferred anxiety level is called the individual zone of optimal functioning (IZOF). Figure 7.5 illustrates the differences athletes have in their preferred level of anxiety.

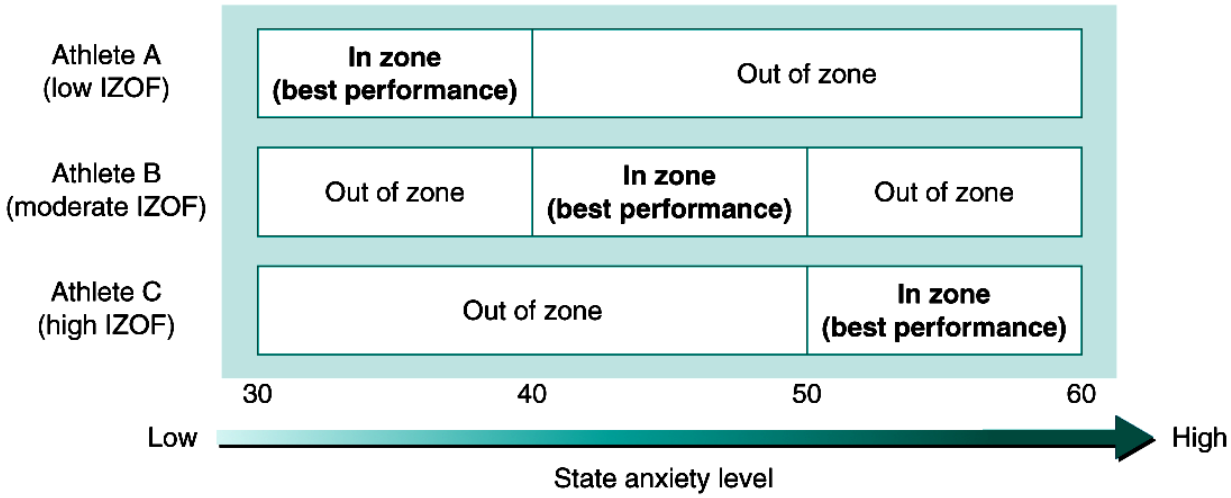

Figure 7.5 Zones of optimal functioning in three athletes.

In Figure 7.5, it is clear that athlete A has a low preferred level of anxiety. We might therefore refer to them as having a low IZOF. Athlete B has a medium IZOF and athlete C a high IZOF. In general, athletes competing in team sports have a lower IZOF than competitors in individual events (Randle & Weinberg, 1997). Athlete A is therefore typical of a team player and athlete C more typical of an individual athlete. The IZOF approach has clear applications for athletes. By knowing your own ideal level of anxiety for competition, you can monitor your current level and decide whether you need to relax or get more psyched up. Some athletes learn to monitor their heartbeat in order to tell whether they are below, in or above their zone. It is also useful for coaches and teachers to know individuals' IZOF. You might, for example, choose

not to use psyching up procedures prior to a competition if you are working with athletes who have a low IZOF and therefore prefer a lower level of anxiety.

There is some support for the idea that athletes do best when at the level of anxiety they prefer. Inlay et al (1993) investigated anxiety levels in field and track athletes across seven competitions and found that, of athletes assessed as being in their IZOF, 63% performed well and 31% performed badly. This provides moderate support for the IZOF theory. However, there are problems with this and similar studies.

Pre-competition anxiety was assessed after the event rather than before. This means that there is some doubt as to the accuracy of measurement. More recently, Russell & Cox (2000) assessed IZOF in 55 American university basketball and football players by measuring their positive and negative emotions during performance. Performances were also assessed. Like those in the Inlay et al study, athletes judged to be in their IZOF because they reported positive rather than negative emotions performed better but only moderately so. This suggests that the IZOF is a valid idea but that it is only moderately important.

Randle & Weinberg (1997) used the CSAI–2 to assess cognitive and somatic anxiety of 13 college-level female softball players and relate these to performance. No difference emerged between performance when in or out of the IZOF; thus, this study did not support the idea of zones of optimal functioning. A further problem was highlighted in a study of Italian rugby players (D'Urso et al, 2002). It was found that the players' preferred level of arousal fluctuated considerably within individuals as well as between individuals. Thus, the IZOF varies as a function of situation as well as person. Despite these problems, however, Hanin's approach has many practical applications and is popular with athletes, coaches and sport psychologists.

Stress management

Regardless of which theories of arousal and anxiety we would consider o be the most correct or useful, there is no doubting the fact that athletes' performance can be seriously affected by their levels of arousal and anxiety. There are a number of psychological techniques for regulating arousal and anxiety that can be applied to sport psychology. We can divide these techniques into three main approaches.

- Relaxation techniques are designed to reduce the athlete's arousal levels.
- Cognitive-behavioural techniques are designed to improve the confidence of the athlete and reduce cognitive anxiety.
- Imagery can be used in a number of ways, both to increase confidence and reduce arousal and anxiety.

Relaxation techniques

Relaxation means to reduce the body's arousal level. There are a number of ways in which we can learn to relax better. Two important ways of achieving relaxation are biofeedback and progressive muscle relaxation.

Biofeedback

One reason why we are not good at regulating our arousal levels consciously is that we have no accurate way of perceiving how aroused we are. The indicators of arousal, such as heart rate, blood pressure and skin temperature, are all very difficult for us to judge. The principle behind biofeedback is that if we can receive accurate information about our arousal level we can learn to control it consciously.

Progressive muscle relaxation (PMR)

PMR was the first of the modern relaxation techniques. Jacobson (1929) proposed that, by relaxing each group of voluntary muscles, we can induce relaxation in the involuntary muscles as well. He developed a technique whereby each group of voluntary muscles is relaxed in turn. In the modern version of PMR, four sections of the body are relaxed in turn. These are the arms; face, neck, shoulders and upper back; stomach and lower back; and the hips and legs. Participants are taught to tense each muscle group before relaxing it, helping them to appreciate the difference in sensation between tense and relaxed muscles. A training session lasts about 30 minutes. Once athletes have mastered the techniques of PMR they can induce relaxation much more quickly. An extract from a PMR training session (adapted from Harris & Williams, 1993)

Cognitive-behavioural techniques

Cognitive-behavioural techniques for stress management, although only recently developed by psychologists, are rooted in the writings of the first-century philosopher Epictetus, who wrote that people are disturbed not so much by things as by the views they take of them. The principle behind cognitive approaches to stress management is that if we can make athletes perceive events as less threatening, they will not respond to them with the same anxiety. There are many forms of cognitive-behavioural therapy that can be applied to controlling competitive anxiety.

Goal-setting theory

Over the last decade, the goal-setting approach has become popular in industry and education as well as in sport. The idea behind goal setting theory is that, faced with the broad, general aims of whatever

we are trying to achieve, we are likely to feel overwhelmed, demotivated and anxious. By breaking down the general goal to a number of smaller and more specific goals, we can make what we are trying to achieve appear less intimidating and more achievable. Thus, goal setting theory is both a theory of motivation and stress management. A rugby back might wish to improve his game. However, this broad aim is difficult to achieve because there are so many aspects to the game of rugby, and because the size of the task is so daunting that it creates anxiety. According to goal-setting theory, players should first identify one or two specific aspects of their game to work on. They should then set themselves small manageable goals for improvement. For example, the players might identify their tackling as an area to improve. They could then set themselves the highly specific task of successfully bringing down opponents 75% of the time in the next game, and increasing this to an average of 80% by the end of the season.

Goal setting has been applied to teams as well as individuals.

Johnson et al (1997) randomly allocated 36 novice bowls players to different goal-setting conditions. One group was told to 'do your best'. The second group was set individual goals. The third group was

Box 7.6 Guidelines for effective goal setting

1. Specific goals are better than general goals.

2. Goals should be measurable.

3. Difficult goals are better than easy goals.

4. Short-term goals can be useful in achieving longer-term goals.

5. Performance goals are better than outcome goals.

6. Goals should be written down and closely monitored.

7. Goals must be accepted by the athlete.

Imagery techniques

The golfer Jack Nicklaus once said that a good shot is 50% due to the golfer's mental picture of what the shot should be like. The use of the 'mind's eye', or imagery, is considered important both in stress management and in focusing athletes on their task. Imagery can be used in various ways to aid relaxation and focusing. Sport psychologists distinguish between *external imagery*, in which athletes picture themselves from outside performing, and *internal imagery*, in which they view themselves performing from inside their own body. A good example of internal imagery is in the mental rehearsal of sporting techniques.

Mental rehearsal

Most of us that have participated in sport have, perhaps before a match, mentally rehearsed some of the actions that will be required during the contest. Mental practice of techniques does not necessarily involve imagery – we can mentally rehearse a tennis serve without visualising a tennis court and opponent in front of us. However, many athletes find that visualisation of themselves carrying out techniques is particularly helpful.

Mental rehearsal probably works for a number of reasons. The *psychoneuromuscular* theory emphasises the importance of 'muscle memory'. When we imagine carrying out a sporting technique, the nervous system and muscles react in a similar manner to that expected if we were actually carrying out the technique. This means that imagery helps us to learn and practise techniques. Another reason mental rehearsal works is that it desensitises us to the anxiety of competitive situations. The more we are exposed to things that cause us anxiety – whether in real life or in our imagination – the less anxiety they cause. Vealey & Walter (1993) have described the use of imagery by the Soviet Union Olympic Team in the 1976 games.

Choking

Choking is a phenomenon in which performance is suddenly and severely impaired by intense anxiety. It is most problematic in sports requiring fine motor skills such as golf, snooker, tennis and darts. Performers as notable as

John McEnroe, Ian Woosnam and Eric Bristow have been sufferers. Golfers call choking 'the yips'. It tends to occur in high-pressure situations, but can easily become a habit. Athletes report that when choking occurs they experience rapid heartbeat, shakes, butterflies in the stomach, racing thoughts and panic. Often, there are unintentional muscular movements or tension becomes so great that a movement cannot be completed. As Moran (2004) says, choking is particularly interesting to psychologists because it represents a paradox. Sport psychologists spend considerable time trying to understand motivation in order to persuade athletes to increase their efforts, but choking occurs precisely because the athlete is trying too hard.

Choking is generally regarded as an anxiety problem. Influenced by drive theory (see p 120), Baumeister (1984) suggests that our ability to perform fine motor skills is affected by the pressure of the situation because selfconsciousness leads the performer to make a conscious effort to carry out a task that is already mastered and so would normally be carried out automatically. Effectively, this means that the athlete has unlearned how to perform the technique.

Chapter Four

Psychological Skill Training in sport

Peak performances are those rare moments when everything comes together for an athlete, both physically and mentally.

The main purpose for developing a mental training is see in the axiom,"mind and body cannot be separated". Following the work of Russian Sport Psychologist Yuri Hanin, this mental state is often referred to as the "zone", short for "zone of optimal functioning". Many athletes, over time, have expressed the characteristics they have experienced during peak performances. These include:

- A narrow focus of attention
- Feeling that the performance is effortless & automatic
- Complete control of mind & body
- A positive attitude & self-confidence
- No fear of failure
- Feeling totally relaxed

According to Hodge, Sleivert and Mackenzie (1996, p. 58) a PST **skill** is a "competency, capability or ability level", while a method used to develop a skill is a "procedure, technique or drill". These authors believe that the major mental skills are motivation (for optimal physical activation), self-awareness and self-esteem (for optimal mental activation), and self-confidence (for optimal concentration). The major methods they encourage athletes to use are *goal setting, mental preparation, self-talk,* concentration, *relaxation, imagery and* performance routines

Mental preparation

Mental preparation can take the form of three plans for performance, namely:

- **Pre-performance plan** is all about your preparation for the day of competition and this may include methods such as self-talk, imagery and centring

- **During performance plan** assists you to focus on what is important during the event and this might be divided into different stages of the event. Coaches should set up situations in training sessions that utilise the mental skill required in performance.
- **The coping plan** is designed to assist athletes with any hassles or distractions pre, during or post the event. Setting up and discussing potential 'what if' situations as part of preparation for competition will prepare athletes for cope with both the situations discussed and unexpected incidents.

Goal setting

The best way to go about improving a skill is to set goals and monitor these goals. Goals provide you with a 'map' to reach your final destination (long term goal) with pit stops (short term goals) along the way. That is, you have your ultimate (or dream) goal but to reach it you must break it down into smaller steps. This serves several purposes. Firstly, it allows you to monitor your progress and thus tell you whether you need to increase your effort or training. Secondly, achieving these short term goals provides you with a reward for your effort and hard work, which in turn increases your confidence that you can achieve the next short term goal and retain your motivation.

Performance, Process and Outcome Goals

People can set different types of goals; these can be based upon pure outcome such as "I want to win a particular race" or "beat a particular opponent" etc. However, outcome goals are usually not under your full control and can be a major source of pressure. Consequently it is usually better to set **process** and **performance** goals.

Process goals are about mastering specific skills such as passing in rugby, turns in swimming or shooting in netball. If you succeed in doing these skills well you will more than likely increase the probability of achieving your desired outcome: winning. Examining the process required to achieve your goals allows you to break your goals down into components or actions and this should form part of your tactical and technical skill development. Combining process goals with performance goals allows you to monitor your progress against yourself, and allows you to *honestly* evaluate your progress. For example, there may be some technical process goals you set yourself to improve a particular skill (such as tackling in rugby). Combining this with a performance goal (to make 80% successful tackles in a game or training drill) allows you to monitor your progress.

Generally, process goals focus on how to do something while performance goals focus on objective success or failure at the task.

SMART goals

Being SMART about goal setting reminds you that your goals should be:

Specific: Set difficult but realistic positive performance and/or process goals that are clearly stated

Measurable: Set numeric goals so your progress can be easily measured

Adjustable: Goals (and goal schedules) may need to be changed due to such things as injury or sickness. Or you may have set goals that were in hindsight to easy or too hard. Also you should review your training methods to see if they are effective and adjust your goals if needed.

Realistic: Know your limitations, but set goals that are challenging. Setting goals that are too hard sets you up for failure, but they also need to stretch your abilities.

Time Referenced: Set target dates for achieving your goals. Again these should be challenging but realistic.

Another key consideration to good goal setting is that the goals are **determined and accepted** by both the coach and the athlete. The most effective goals are those that the athlete feels they have ownership for. If you find that your athletes do not seem to be motivated towards achieving the goals that have been set, it may be a sign that they feel that the goals have been forced on them by somebody else, for example, parents, coaches, or team mates.

Monitor your commitment to your goal

Write them down: Write down your long term and short term goals and your strategy for achieving them. This should include target dates for added incentive.

Remind yourself of your goals: Use a training log book to monitor your progress. Alternatively, use a wall planner as a visual reminder of your goals, target dates and training plan.

Self Analysis: Ask yourself periodically, "what have I done to make myself better?" Monitoring your performance is best done by you, as self evaluation is a critical component of success in all walks of life.

Goal Setting: Things to Avoid

- Setting goals that are not SMART

- Setting too many goals at once: keep it simple.
- Not monitoring your progress.

Relaxation/Activation

The ability to be composed under pressure is a necessity. Most world-class athletes are nervous when they compete. The difference between those at the top and those lower levels is the way in which nervousness is managed. It is all right to have “butterflies in your stomach” as long as they are “flying in formation.” The top athletes treat performance anxiety as a friend. It is great to be excited about the opportunity to compete. However, when these butterflies start to interfere with the performance, it is crucial to have ways to gain control instantaneously.

Finding this balance between feeling overly-energized and overly-relaxed is a key concept in mental training. Understanding arousal and how it affects athletic performance must first be understood. A person’s level of arousal can be found anywhere on a continuum from extreme energy and vigor to no energy or motivation.

The inverted-U hypothesis (figure 1) posits that as arousal increases from drowsiness to alertness, there is a progressive increase in performance levels. On the other hand, when arousal continues to increase beyond alertness to over-excitement, the performance levels decrease significantly. So, what is the proper level of arousal? Your optimal level of arousal may shift to the right or left, based on your personality and coping style. This will vary from training to competition. In a competitive situation the answer lies within your fencing style, your level of fitness and your ability to maintain a positive focus. In critical performance situations the well trained (physically and mentally) athlete is better able to tolerate the elevating arousal level and may even draw extra energy from competitive pressure.

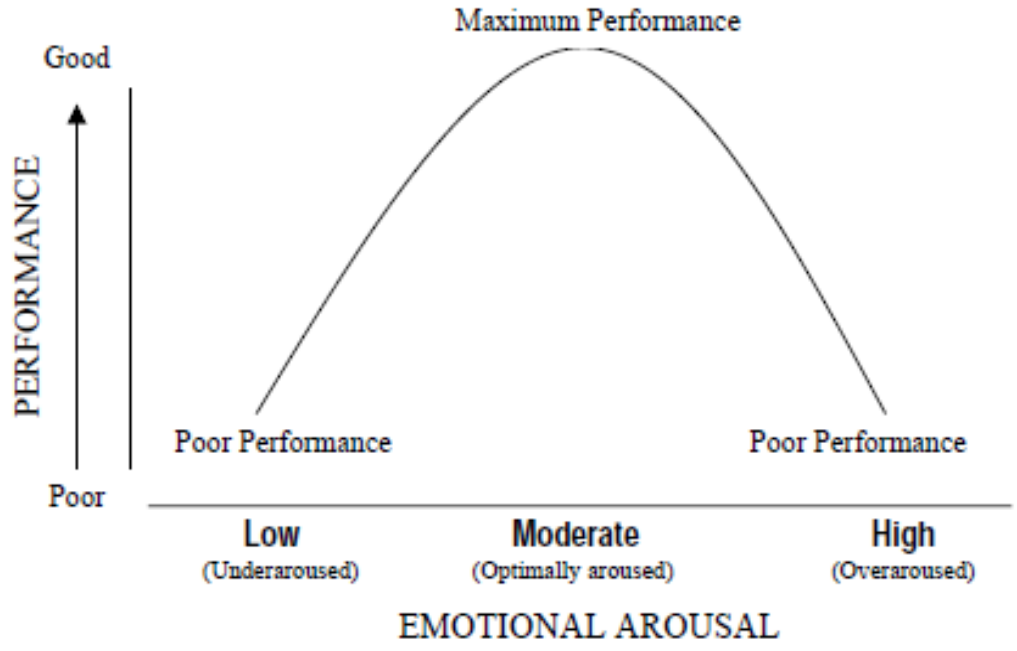

Figure 1: The Inverted-*U* relationship between arousal and performance

Relaxation

In order to relax in the midst of a stressful situation, sometimes the simplest method can bring about the best results. Breathing properly is great place to start. Proper breathing comes from the diaphragm. Breathing from the chest and shoulder areas is often associated with increased muscular and mental tension. Once a relaxed breathing pattern is established, you can calm yourself even further by relaxing your muscles once group at a time. When proper breathing techniques are employed, a simple relaxation exercise to use is seen in figure 2. Techniques such as this are best learned in a quiet place, laying or sitting in a comfortable chair with you eyes closed. With practice, the same effect can be accomplished with your eyes opened in a busy, stressful environment.

This particular technique is designed so that the length of practice may vary. You can move through the exercise at a comfortable pace, taking plenty of time to modulate your breathing and moving slowly through the "1 to 10" count and perhaps even repeating it 2 or 3 times. After practicing this a few times you will remember the way the numbers match up with the part of your body you would like to relax. You may even consider creating a personal audio tape of this exercise using your own voice. After regular practice at a measured pace (5-15 minutes), you can practice moving through the "1 to 10" count quickly as a way of calming yourself in a situation where time is limited.

Please close your eyes. Turn your attention to your breathing. Be an observer to the process of your breathing. And notice the way in which you breathe. Is it deep or shallow? Regular or irregular? Let your self come to a way of breathing that is deep, slow, and regular. You will find as you breathe in this way, you will quite naturally come to be comfortable, relaxed, and at ease. (Pause.) now you will find that you may relax even further by focusing, in conjunction with your breathing, on the muscle groups of your body. In a moment you will begin to count slowly from "1 to 10" focusing your attention in order on the muscle groups of your body. Ready to begin? Breathe in, count "1" silently to yourself, focus your attention on the muscles in the abdomen, and when you breathe out let these muscles relax. (Repeat: 2-chest/ 3-back/ 4-hips and thighs/ 5-

lower legs and feet/ 6-shoulders and upper arms/ 7-forarms and hands/ 8-shoulders, neck, in lower jaw/ 9-face and head/ 10-whole body.) once again, turn your attention to your breathing and let it be comfortable, relaxed and at ease. (Pause.) Now count backward from "3" to "1" and open your eyes. When you open your eyes, allow your self to remain relaxed and at ease.

Figure 2. Relaxation 1-10, by John Heil, D.A.

Relaxation can also be accomplished in variety of other ways, for example: listening to quiet music, focusing on something not related to fencing, or finding a quiet place in the competition venue where you can retreat and settle your emotions.

Activation

Once athletes learn how to relax properly, they can begin to learn correct activation techniques. There are many variations and techniques on how to increase energy but the key to remember is when. The timing of athlete's activation is crucial for whether or not they reach their optimal level of arousal at the right moment. Some good activation exercise include listening to energizing music, reviewing competitive goals, and using imagery to imagine yourself competing against your next opponent. Breathing can also be used for arousal. The basic physiological concept here is that an increased rate of breathing will increase the athlete's heart rate. With increased arousal comes other changes in body chemistry that can create an "adrenaline surge". If these methods do not work, consider doing some "fast twitch" muscle work, like running quickly in place to elevate your heart rate.

Probably the most common method for increasing an athlete's activation level is a pep talk by the coach. A pep talk is a psyching-up strategy that is designed to increase your arousal and activation level. This may include personal challenges, stories, reasoning, and even silence. However, since the activation relies on the quality of the verbal communication, pep talks can prove to be unreliable a lot of the time,

sometimes even overenergizing the athlete. Each athlete begins with a different initial level of arousal. Increasing arousal affects each athlete differently. Intervention procedures are best applied individually based on prior experience between the coach and the athlete. It is important that the athlete and coach take ample time during training to discuss which approaches work best to energize and focus the athlete. Like other training methods, this needs to be refined over time through the process of trail and error and continuing candid conversation between coach and athlete. Time out periods during direct elimination bouts are especially critical because there is so little time. The coach must prioritize whether presenting tactical information is most important - or alternately whether the athlete needs to be relaxed or energized, or simply a confidence boost.

Concentration

Concentration is able to focus on the right thing, in the right way, at the right time. You must focus your attention on the task at hand and to not be distracted by internal (thoughts, feelings) or external (noise and other distractions from the environment) stimuli. Correct concentration cannot be forced, but learned as an acquired skill where in you remain in the present time, not thinking about the past or future. Nideffer proposes a model of concentration that identifies focus dimensions.

Figure 3 illustrates these distinct attentional styles.

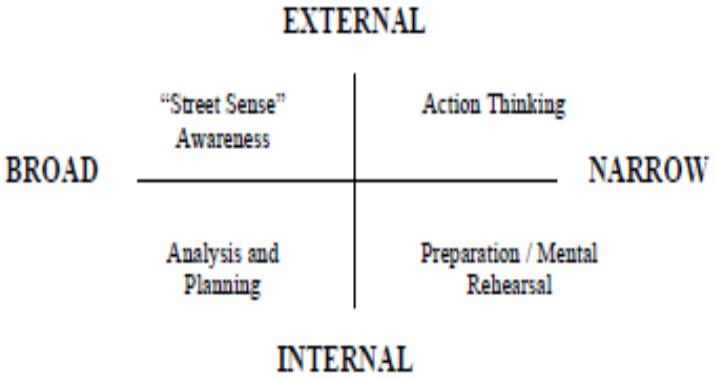

Figure 3. Dimension of Attention, Dr. Robert Nideffer

Learning to focus not only while fencing but also between touches and between bouts is paramount to good performance. It is competitive fencing that the habits of concentration are developed and really put to the test. It is important to have a game plan and to concentrate on your plan throughout a bout. If distractions occur, they must be put aside and focus regained in order to perform your best. For example,

if you feel a director made a bad decision that cost you an important touch, it is too easy to waste valuable time feeling resentful or angry. While focusing on emotional reactions to such a situation, attention is diverted to the real issue at hand. The call went the wrong way so what can you do to see that the mistake is not repeated? Free your mind from outside pressures and focus on your performance, not on the outcome of a bout.

Proper concentrating can not be forced but comes through practice and experience. Following is an exercise, designed by Zealand (1995), to help you improve your concentration by changing your focus across varied dimensions.

Concentration Training

When practicing, athletes should make sure they are in a comfortable position.

1. For the next few minutes, take your self through the "Relaxation 1-10" exercise. Once you are fully relaxed, proceed to the next step.

2. Now listen to what you hear by taking each separate sound, identifying it, and then mentally labeling it, such as voices, footsteps, or a cough. Next, simultaneously attend to all the sound without attempting to identify or label them. You should listen to the mixture of sounds as you would music, while verbal thinking falls away.

3. Now become aware of bodily sensations such as the feeling of where the chair or floor supports your body. Mentally label each sensation as you notice it. Before moving on to another sensation, let each sensation linger for a moment while you examine it; consider its quality and its source. Next, feel all these sensations simultaneously without identifying or labeling any particular one. This compels you to go into the broadest possible internal body awareness.

4. Attend now only to your emotions or thoughts. Let each thought or emotion appear gently, without being forced. Identify the nature of your thoughts and feelings. Remain calm no matter how enjoyable or repulsive they may be. Feel one, then another, then another. Now try to tune into only one and hold your attention there.

5. Open your eyes and pick some object across the room directly in front of you. While looking ahead, see as much of the room and the objects in the room as your peripheral vision will allow. Simultaneously

observe the entire room and all the items in it. Picture now a broad funnel into which your mind is moving.

Centered in the middle of the funnel is the object directly across the room from you. Gradually narrow your focus by narrowing the funnel so the only thing at the small end of the funnel is the object across from you. Expand your focus little by little, widening the funnel until you can see everything in the room. Think of your external focus as a zoom lens; practice zooming in and out, narrowing or broadening your focus according to your wishes.

Self-Talk

Successful athletes are self-confident athletes. What you think or say about yourself in practice situation is critical to how you will perform. Self-talk can become a self fulfilling prophecy whether positive or negative. In a positive light, self-talk can facilitate performance and replace irrational thoughts with productive thoughts. Since all athletes can be a great aid in performance. This simply involves using key words or phrases to reinforce performance goals or to create a positive mental state.

Athletes can lose focus in competition by dwelling on their recent mistakes rather than their present performance. They may put themselves down (e.g.,“That was a stupid move.”) and be discouraged (e.g. “I can’t win.”) decreasing confidence effort, and performance. Self-talk can be employed to help stay in the present. It can be used in conjunction with the methods discussed in the section on concentration. Affirmations can improve mood for the athlete by using key words to trigger positive emotional states. Similarly, positive self-talk can change moods from nonproductive to productive. For example, it can allow an athlete t turn the “energy of anger” into a productive form to facilitate performance. In addition, you can employ self-talk for maintaining your intensity to the end of a long direct elimination bout. In this sense, athletes are attempting to sustain performance by controlling factors that would prematurely end the effort. Self-talk can be employed in a variety of ways to manage worry. Four methods for managing worry include problem solving, thoughts saving, thought reviewing, and thought stopping.

Problem Solving

In this sense, problem solving is converting worry into production action. Uncertainly about how to solve problems can lead to procrastination, and cause a problem to turn into worry. When this happens, the athlete needs to make a commitment to deal with the problem head on. For each worry, create a list of possible solutions along with the pros and cons of each solution. This accomplishes two purposes. It

breaks a larger problem down into smaller, more manageable parts and gives direction to make things different. If this does not move you toward a solution, seek advice from someone trustworthy. Some things in life cannot be changed. These need to be accepted. When this happens, it is important for you to be okay with yourself even though you are not able to solve the problem.

Thought Saving

Thought saving is taking a break from worry. Great athletes, artists, and scientists have learned that after working on a problem for a while you need to set it aside. The "Incubation Theory" suggests that at an unconscious level your mind can continue to work on a problem even as you go about other activities. When you train at fencing: you work then rest, work then rest. You need to do much the same thing with mental work. However, sometimes it can be very difficult to let a thought go. When this occur, you may try saving your thoughts by writing them down on a piece of paper.

You can return to them when your are refreshed, and ready to work and take up where you left off. This method is especially helpful at bedtime when you cannot sleep because you are preoccupied. Perhaps it is the night before a competition and you recollect some last-minute details you need to take care of. Rather than reminding yourself to remember to sleep, get up and write it down and go back to sleep.

Thought Review

Thought review can be viewed as managing expectations. As a competitive athlete, you will always be subject to the expectations of others including teammates, coaches, and parents. Do not let yourself be weighed down by someone else's expectations. Discard those you do not need and hold on to those that energize you. Realize that most expectations that you carry for others and are worthwhile are already yours to begin with – so there is nothing else you need to do with these. When distracted, refocus on the skills and attitudes that have helped you to be successful.

Thought Stopping

Thought stopping is used to shift quickly to a positive focus. Sometimes it is as if your logical side, which is striving to be positive and achieve competitive goals, is in conflict with your emotional side that has turned negative out of competitive anxiety or fear of poor performance. Thought stopping is a way for your logical side to talk to your emotional side so that your emotional side will truly understand. Thought stopping is a quick, intense technique for asserting your desire to excel and prevail over your

worst fears. It serves as the foundation of a powerful three-step refocusing technique, which is described below.

1. STOP!!! Say it like you mean it, so that you can feel a reaction.

2. COMPOSE yourself with a smooth even breath deep into your diaphragm.

3. REFOCUS on a key fencing thought or action.

For example, imagine you are in between bouts and find yourself feeling uptight and tense with thoughts darting through your mind. You take a moment to mentally step back and look at your thoughts. As you do this, you become aware of negative thoughts like “What if I do not win this bout?”, “My next opponent is really strong”, “I don’t know if I can win.” Each time a negative thought occurs you grow even more tight and tense. Next, you need to identify refocusing thoughts or ideas. For example, you decide to refocus by saying the word “confident” to yourself and then imagining executing a strong, precise fencing action that you feel will work against your opponent. Then, each time the thought occurs, you practice the technique.

The use of positive self-talk will improve your performance by managing worry and frustration, shifting from negative to positive emotional states, and helping you create a present focus. As such it builds self-confidence, helping you perform to your potential.

Imagery

Unless you can imagine success, chances are that it will not occur. Through imagery you can, in an instant, imagine any variety of sports skills that might take pages of written text to describe. Imagery methods rely on the creation of an “inner theater” where any of life’s dramas including sport performance may be played. Unlike physical practice, imagery can be utilized at any time and under any circumstances.

Imagery varies along several dimensions that are relevant to sport performance, including sensory-perceptual modality, perspective, speed, attentional focus, and mastery. Often imagery is referred to as

visualization, reflecting the dominant role of vision of vision in our sensory-perception experience of everyday living. In sport, the visual and kinesthetic senses are most closely linked to successful performance.

However, there is an important role for the other sensory-perceptual modalities as well. For example, touch and sound may be used to create a more realistic scenario (e.g., the feel of your weapon in your hand; the sound of the scoring machine buzzing; the scraping of metal on metal); and may provide important performance cues (e.g., the rhythm of your opponents footwork; the tempo of the blade actions). Including a broad variety of sensory-perceptual modalities will help you set the stage in your "inner theater".

In mental rehearsal you can adopt an internal (through ones own eyes) or external (a cameras eye view) perspective. It is generally assumed that the advantage of the internal perspective is that it puts you in better touch with the kinesthetic elements of your performance, and that the visual cues experienced most closely resemble those that would actually be seen in the sport environment. There are also potential advantages to be gained by adopting an external perspective. Sometimes the view from a different angle can provide a better sense of an opponents actions. Coaches are sometimes quite selective in where they choose to stand to watch a bout – why is this? Learning from videotapes of oneself or ones opponents requires working from an external perspective.

For most sports, an associative focus (attention directed to sport performance cues) is essential. However, at times purposeful distraction from some elements of competition can be helpful. For those athletes who experience persistent performance anxiety, it may be helpful to dissociate from crowd sounds or other crowd behavior.

When fatigued or suffering a minor injury, the fencer can better focus on performance by dissociating from physical discomfort. At other times it is critical to have an athlete tune in" on an injury to avoid aggravating it.

Altering the speed of imagery during rehearsal offers different possibilities. Real time imagery helps with timing and coordination of complex skills. Slow-motion rehearsal is used for troubleshooting problems with techniques and for learning key sequences in new skills. For example, you may find it helpful to visualize practicing complex patterns of blade work in order to refine your game. High-speed imagery is

beneficial for reviewing competition plans. This is something you can use just before your bout to help ready your self for the actions you anticipate using.

In mastery rehearsal, scenarios are imagined as happening according to plan. A mastery style rehearsal of skills or tactics aids mental preparation by focusing attention and building confidence. Coping rehearsal has the added advantage of helping you anticipate potential problems (e.g., distractions, negative emotions, performance errors) and to practicing refocusing following their occurrence.

While all your images will not fit neatly into categories, it is important to gain a better understanding of the variations of imagery and the role that these play in performance. Most athletes instinctively use imagery in one form or another. As with all sport skills, a strong knowledge of fundamentals is the foundation of skill development. Imagery rehearsal used in conjunction with physical training aids in learning new skills, maintaining and refining existing skills, troubleshooting performance problems, and simulating various fencing situations.

Accommodating individual differences, creating an “inner theater”, following progressive learning sequence, and generalizing from mental skills to performance skills enhances the effectiveness of imagery training.

Individual differences in sport skills, visual imagery ability, and motivation for intensive imagery training will determine the type of mental imagery program that is best suited to each athlete. The stage for this “inner theater” is set but the use of multisensory imagery, by personalized imagery, and by providing preliminary relaxation training. Skills (whether mental or physical) are best learned by attempting relatively simple tasks at first, and as these are mastered, moving on to more complex tasks. The ability to create effective imagery is improved through practice. As relaxation and imagery skills develop, the same mental tasks can be rehearsal time, making the use of brief imagery methods increasingly practical. The ability to use brief segments of imagery rehearsal at key moments in competition greatly enhance focusing skills. And it helps athletes stay fixed on the actions that they want to happen (instead of those they want to avoid).

Positive imagery cannot guarantee a good result but it make it more likely. You will probably be most comfortable initially with guided imagery where your sport psychologist or coach functions as the “director” of the “inner theater.” However, the goal is to have yourself eventually function as both “director” and “lead actor.” This is accomplished by a gradual shift from guided to independent practice.

The ultimate test imagery training is how well it serves you in competition. Imagery will eventually need to be practiced in training and competitive situations. Eventually imagery (and other mental skills) should become instinctive or second nature, occurring almost automatically when needed. Consistent practice of imagery training provides an opportunity to develop skill and confidence so that the possibilities of performance can become reality.

Performance Routines

Performance routines are the stepping stone to maintaining focus under pressure. Performance is likely to be enhanced in an athlete when preparation becomes more systematic. These routines give you control over your external and internal environments. The more familiarity, routine, and structure you can have in your external environment, the easier it is for you to be in control of your internal environment. For example, the external environment can be stabilized by fencers starting their warm up at the same time before each bout, eating the same precompetition meal, and going through a mental preparation routine. Once the external environment is controlled, the internal environment can fall into line. This means monitoring and controlling your emotions so that the energy and focus for competition is reached at the right time.

The most effective routines are individualized, and will have some variation based on conditions. The routine should help the athlete focus on thoughts, feelings, and bodily sensations linked to successful performance. When this is done an athlete can make the necessary adjustments to reach his/her ideal performance state. A good place to start in developing your routine is to look at what you are already doing before competition. The best athletes in the world have well refined competition routines that help them maintain their psychological equilibrium under virtually any condition. Use performance routines in practice everyday so that they become second nature. As a general rule, be systematic in developing and implementing routines. Athletes should refine and revise performance routines to help build confidence in their ability to cope with setbacks or surprises.

Below are come guidelines and techniques to use in developing and using performance routines.

PERFORMANCE ROUTINE GUIDELINES

All athletes have performance routines. Breakdowns in routines can come about because of poor performance or increased pressure and in turn lead to further decline in performance. Carefully planned and practiced routines enable you to be more mentally resilient and help maintain good performance

under adversity. You should establish preset routines for competition including precompetition routines between bout routines and even between touch routines. “Between touches” and “between bout” routines contain the same key elements as all you performance routines. These elements are :

(1) an analysis of prior actions and planning for upcoming actions, and

(2) refocusing, that is, being mentally ready to fence. The main difference relates to the amount of time available for the routine and the varying opportunities this presents. It will take some time for you to develop, if you do not already use, your own ideal performance routines.

Once you have identified a definite routine, it should be consistently practiced. Eventually these routines will serve automatically to trigger your mental skills like concentration, relaxation, etc., for peak performance. General guidelines for competition follow.

The psychological skills should be integrated with the athlete’s physical skills. This is the antecedent to practicing skills in a performance-specific manner. However, athletes must remember that learning and properly implementing psychological skills requires patience and consistency during practice. For example, the first mental skill discussed in the manual is relaxation. Once an athlete has effectively mastered the relaxation techniques in mental practice sessions, attempting to integrate these skills in physical practice, and eventually in competition should occur. Systematic integration through consistent rehearsal will result in the long-term success that most athletes and coaches are seeking.

Mental skills training is a collaborative process between athlete, coach, and sport psychologist. Ideally, a qualified sport psychologist should develop and administer the psychological skills program. However, with some training, the coach can work with the athlete on the development of mental skills taking this a step beyond what they coach might otherwise do.

Chapter Five

Social factors in sport performance

Groups and teams

As social animals, we spend a considerable amount of our time in groups.

A group has been defined by Moorhead and Griffin (1998) as 'two or more persons who interact with one another such that each person influences and is influenced by each other person' (p 291). A team is more than just a group.

Moorhead & Griffin define a **team as** 'a small number of people with complementary skills who are committed to a common purpose, common performance goals, and an approach for which they hold themselves mutually accountable' (p 293). A team in the broader sense is not *necessarily* a group, because the members of a team can be working for a common aim without ever coming into contact with one another. For example, the British Olympic Team is clearly devoted to a common purpose, but it is not necessarily a group, because its members *could* fulfill their team roles without swimmers, boxers and long-distance runners ever meeting and directly influencing one another. Usually, however, when we refer to a team in sport psychology we are also referring to a group of people who play together and have a powerful influence on each other. For this reason, the terms *group* and *team* are sometimes used interchangeably.

Group formation

Merely placing a collection of individuals together does not in itself create a group or a team. Tuckman & Jensen (1977) suggested that when groups come together they go through five distinct stages.

- ***forming*** stage:- the group members get to know each other, and basic rules for the conduct of group members are established.
- ***storming*** stage:- members compete for status in the group, and group members take on different roles.
- ***norming*** stage:- the group settles down, and group members develop attachments to each other and to the group.
- ***performing*** stage:- the group members become oriented toward the task they have come together for, and begin to achieve their goals.
- ***adjourning*** stage:-the task of the group has been accomplished, and it drifts apart. As Sutton (1994) points out, although this model of group formation is useful, not all groups operate in this manner. For example, in football, unless a new team is being started, it is unusual for a group to form in

the way described by Tuckman & Jensen (1977) because new players join the team at different intervals. For an individual player joining an *existing* team, things are likely to be rather different.

Group cohesion

The word cohesion literally means *sticking together*. Festinger et al (1950) defined group cohesion as the sum of the forces that influence members in whether to remain part of a group.

A highly cohesive group is likely to be more united and committed to success than a group low in cohesion. It is often said that a team is more than just the sum of the individual players. This is because the cohesiveness of a team can be just as important as the talent of individual team members. If you are a follower of football or rugby, you might have noticed that, in certain seasons, teams composed of brilliant individual performers collectively underperform. This is probably due to the fact that the team members have somehow failed to 'gel' together. This is an example of lack of cohesion.

Elements of group cohesion

Widmeyer et al (1985) distinguished between two different aspects of team cohesion. Each member of a team has a view of the team as a unit (this is known as the members' *group integration*) and of every individual within it (this is called the *individual attractions*). The members may also have different perceptions of the team and its members as regards their sporting performance and their social interactions. In other words, you can think of your team-mates quite differently as individuals and as a team, and as people and co-competitors. We might, for example, see them as socially unpleasant both individually and collectively but as effective co-competitors. Carron et al (1985) devised a psychometric test, the Group Environment Questionnaire (GEQ), which can be used to measure team cohesiveness. The GEQ considers group integration and individual attractions, and both the task achievement and the social life of a team.

Factors affecting team cohesion

the following four factors affect team cohesion:

- @ a clear role for each member of the team,
- @ willingness to make personal sacrifices for the good of the team,
- @ quality of communication between team members and
- @ shared goals for the team as a whole.

- An additional factor may relate to coaching style. Turman (2003) looked at a range of coaching techniques and attempted to relate these to team cohesiveness. It emerged that use of embarrassment, ridicule and *inequity*, that is, talking down to athletes, has a negative impact on cohesiveness, while athlete-directed technical assistance, motivational speeches and team prayers all had positive effects.

Thinking more broadly, Carron (1993) identified four types of factors that affect the cohesiveness of a team.

- *Situational factors* include the physical environment in which the team meets and the size of the group.
- *Individual factors* refer to the characteristics of the athletes that make up the teams. For example, the satisfaction of individuals in being in the team can have a powerful influence on cohesiveness.
- *Leadership*. Team coaches, captains and managers have a role in helping to make the team cohesive.
- *Team factors* include past shared successes, communication between members and having collective goals.

Cohesiveness and performance

Numerous studies have shown that there is a relationship between team cohesiveness and success; that is, more successful teams tend to have greater cohesion. It was found that teams with low cohesiveness were more likely to underperform.

There is a logical problem of studies like this, however; they do not tell us whether the teams became more successful *because* they were already more cohesive, or whether, instead, they *became* highly cohesive because of their shared success. Actually, it is quite possible that both of these relationships hold true.

Interestingly, not all studies have supported the relationship between cohesiveness and performance. In one experiment, Grieve et al (2000) randomly assigned 222 male university student basketball players to three-person basketball teams, and manipulated the interactions of each team in order to create either high or low levels of team cohesiveness. Each team was th n assessed for cohesiveness, given a series of games and then assessed again for cohesiveness. In this study, there was no relationship between early cohesiveness and later performance; however, successful early performance was associated with high levels of cohesiveness at the end of the games. This suggests that cohesiveness does not influence performance but that performance *does* influence cohesiveness.

Developing team cohesion

Strategies to develop team cohesion are known as *team building*. Carron et al (1997) offer a four-point model for team building, which aims to increase team distinctiveness, for example,

- by training attire;
- to increase social cohesiveness, for example, by social events;
- to clarify team goals, for example, by having collaborative 'goal of the day' sessions; and
- to improve team communication, for example, by holding regular meetings. Team building has been tested in a number of experimental studies, but the results have been equivocal. Moran (2004) suggests that one reason for this is that team building can improve cohesiveness only if the team lacks it in the first place. Thus, studies on already cohesive teams encounter a ceiling effect and have little impact.

Social facilitation

We have already discussed how being in a strongly cohesive team appears to improve the performance of team members. There are several other ways in which the presence of other people can affect our behaviour and performance. Under some circumstances, the presence of other people, such as competitors, enhances our performance. However, under other circumstances, our effort and our ability to make decisions can be adversely affected by others, leading to poor performance. The term 'social facilitation' describes the ways in which our performance can be affected by the presence of others.

Co-action and audience effects

Co-action effects occur when other people are carrying out the same task alongside us, as in a race, or when training with friends or teammates. One of the earliest studies in sport psychology, by Triplett (1898), found that children asked to wind fishing reels did so faster when in the presence of other children also winding fishing reels. Triplett also found that cyclists who trained with another cyclist practised at faster speeds than those training alone.

Audience effects occur when we are being watched. A study of audience effects was carried out by Michaels et al (1982). Researchers observed pool players in a college student union and selected aboveaverage and below-average players. First those selected were watched, and the percentage of successful shots was recorded. Four researchers then walked up to the tables of the selected players and watched the rest of their game. It was found that the audience had the opposite effect on the below-average and above-average players. The players identified as below average in ability played worse in the presence of an audience,

whilst those identified as above average played better when watched. Not all recent studies have replicated the findings of the Michaels et al study. Geisler & Leith (1997) tested the effect of an audience on penalty taking in 40 Canadian ex-university soccer players. There was no difference in the number of goals scored when alone or with an audience.

The personality of the athlete may also affect the relationship between audience and performance. Graydon & Murphy (1995) assessed the personality of students with the EPI (see p 15 for details), and identified 10 extroverts and 10 introverts. These 20 were given the task of serving a table tennis ball into a grid. In one condition, they did this alone and in another condition they did it in front of an audience. The extroverts performed better in front of an audience, whereas the introverts did better alone.

The home advantage effect

An important application of research into audience effects is in understanding the effects of playing in home and away matches. The home advantage effect (HAE) operates when performance is enhanced by the presence of a large supportive home audience. This is an extremely powerful effect. In football's World Cup, for example, no team other than Brazil has even won the competition when playing outside its own continent. Interestingly, it appears that audience effects increase as the size of the audience increases. Nevill & Cann (1998) examined the size of crowds in home-win games in the English and Scottish football leagues in 1985–96, finding that the HAE was greatest when crowds were large and least when crowds were small.