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An Examination of Debilitative and Facilitative Competitive Anxiety

by

Sheldon Murray Hanton

A Doctoral Thesis
Submitted in Partial Fulfilment of the Requirements for the Award of Doctor of Philosophy of the Loughborough University

June, 1996

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This thesis conducted a detailed examination of debilitative and facilitative dimensions of competitive state anxiety. Competitive anxiety was assessed using the Competitive State Anxiety Inventory-2 (CSAI-2) which was modified to measure not only the 'intensity' (level) but also 'direction' (facilitative/debilitative) of cognitive anxiety, somatic anxiety and self-confidence. A trait version of the questionnaire was also used. Three different research methodologies were employed in this thesis. The first two studies adopted a quantitative research methodology, Study 3 incorporated qualitative techniques and the final investigation addressed the research question via a single-subject design study. The first study investigated intensity and direction dimensions of state anxiety as a function of skill level in a sample of elite and non-elite swimmers. The results revealed that while no differences were evident between the groups on the intensity of cognitive and somatic anxiety, the elite group reported more facilitative interpretations of these symptoms than the non-elite group. Self-confidence was also higher in the elite group. The results suggested elite performers do not differ from non-elite performers on the level of anxiety they experience, but they do have a more positive interpretation of these symptoms in terms of consequence for performance. The second study examined the predictions of a control process model of anxiety proposed by Jones (1995a). Specifically, the study examined the directional perceptions of anxiety as a function of goal attainment expectations. Results showed that swimmers with favourable expectancies of their ability to achieve their goals reported no differences in intensity levels to the swimmers with negative or uncertain expectancies of goal achievement. However, more facilitative interpretations of pre-race symptoms were reported by the positive goal expectancy group. These findings highlighted important applied implications for achieving appropriate pre-performance states via setting appropriate goals that are within the control of the performer. Study three addressed how elite performers have acquired the ability to interpret their anxiety symptoms as being facilitative towards upcoming performance. Qualitative interview techniques and inductive content analysis revealed that the performers did experience negative cognitive and somatic anxiety symptoms when they first started competing. However, by appropriate education and natural learning experiences, the performers became aware that the nerves they experienced could be positive towards the upcoming race. Furthermore, the swimmers developed, and now follow, detailed pre-competition and pre-race routines to maintain this facilitative interpretation. The findings generated important practical implications for attempting to restructure negative interpretations of anxiety symptoms. The final study examined the effects of a multimodal intervention programme on
performers debilitated by their anxiety symptoms, via a staggered multiple-baseline single-subject design over a series of ten competitive races. Following the intervention, the results showed that although intensity levels remained stable, the three performers receiving the intervention reported more facilitative interpretations of both cognitive and somatic anxiety. Self-confidence also increased following the intervention treatment. These findings demonstrated that information generated by elite performers can be transferred successfully in ecologically valid sport environments. The programme of research conducted in this thesis provides evidence that the conventional notion of anxiety as negative towards performance can be questioned and reconceptualised to include positive consequences for performance. The results highlight the importance of future research into other emotions that may have been formerly labelled as anxiety, but which denote a different emotional state altogether.
PUBLICATIONS RESULTING FROM THESIS

**Published Conference Communications**


**Published Papers**


To Mum and Dad
"What is written without effort is read without pleasure"

Samuel Johnson
ACKNOWLEDGEMENTS

I would like to express my sincere gratitude to my supervisor, Dr. Graham Jones for his expert help, advice and guidance. I genuinely feel that I have developed considerably as a researcher, lecturer and sport psychologist due to his influence.

I would also like to extend my gratitude to the other members of the Sport Psychology Research Group at Loughborough University, Liz Campbell, Chris Harwood, Lindsay Bradley and Austin Swain, who have provided me with encouraging support throughout the last three years.

Finally, I would also like to extend my gratitude to my Mum and Dad for their continual support and belief throughout my time at Loughborough, and to Rachel for her understanding and patience over the last year.
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CHAPTER I

INTRODUCTION

1.1 ANXIETY AS A FACTOR IN SPORT

The requirement to cope with pressure, stress and anxiety is accepted as a prerequisite in most competitive sports, particularly at the highest levels (Gould, Ecklund & Jackson, 1993; Gould, Finch & Jackson, 1993; Patmore, 1986). Competitions such as the Olympic Games and World Championships are examples of situations where the pressure on performers is at its maximum level. Indeed, the trademark of elite sportsmen and women in all sporting disciplines is their ability to cope with competition demands and still produce lifetime best results. Patmore (1986) described how sport evolves around stress, and that a major motivational factor for athletes is the desire to confront, withstand and overcome stress. She described sport as an 'experiment' in which the central determining factor in performance is the individual's ability to cope:

"The technical skills of the contestants, if the experiment has been set up correctly, cancel each other out. The sport experiment is not concerned with the particular technical skills that subject has brought with him to the contest. His skill level is not really an issue - although he fervently believes it is - since his fellow contestants also have it; they have been screened and selected very carefully indeed to ensure that their skill compares with his. The deciding factor is not his skill but his ability to perform under stress" (p.13).

There are numerous accounts from performers describing how the stress of top level competition affected them prior to performance. For example, Sharon Davis (1984), the silver medal winner at the Moscow Olympics in 1980, explained how she felt in the lead up to the final following the heat swim in the morning:

"The next stage was a light lunch - a very light lunch because the adrenaline was gnawing away at my stomach.....at 4.45 p.m. I caught the bus back to the Olympic pool with my stomach tied in a knot with nerves. I don't think I have ever been quite that nervous before any other race of my career and my body was producing adrenaline so fast it was making me sick.....Just before the final itself we were gathered together in one room.....I knew that with the volume of support they (all the Commonwealth swimmers) were giving me I would be able to produce my very best.....of course at the same time I felt under extreme pressure" (p.114-115).
On a personal level, I have participated as a competitive swimmer since the age of eleven, competing regularly up to national championship standards. Formerly a 200 metre butterfly and 400 metre individual medley specialist, I developed and turned more towards sprint freestyle events in recent years. Therefore, I would like to recount my own contrasting thoughts and feelings preceding two of the most important races of my senior career; the first at the age of 18 and the second at the age of 25 years.

The first experience is described from approximately four hours before probably the most important race of my life at that time. I was competing at the European Club Team Championships in Hamburg in 1989 against some of the top swimmers in the world from the top 16 clubs in Europe. Arriving at the pool, I can recall an overwhelming sense of fear and trepidation, primarily due to the fact that for the first time in my career I felt completely out of my depth. Although I had performed consistently well on the domestic scene, I had never experienced senior swimming at this level before. Following the warm-up, I had approximately one hour before the 200 metres individual medley, the event I had been selected for. Physically, I was experiencing intense butterflies, tension in my shoulders, heaviness in my legs and an enduring feeling of tiredness and lethargy throughout my entire body. I felt that although I was in excellent physical condition and had trained meticulously, I could not have been in a worse state of readiness at this point just before the race. All my conscious thoughts centred around the fear of performing poorly and letting the others in the team down, which at the time seemed unforgivable. I had no control whatsoever over either my mental state or the physical symptoms I was experiencing.

Contrasting with my experiences in Germany, the second scenario describes how I felt before competing at the World Challenge at Ponds Forge in Sheffield in December 1994. I had performed well all throughout the meet and my confidence was riding high, but the biggest challenge was yet to be confronted. Myself and my teammates had prepared thoroughly for the 4 x 100 metres sprint freestyle event on the Saturday and we aimed to place in the top three. Although no overseas clubs competed in the relay events, the opposition was extremely strong, in that some of the squads included Olympic, European and Commonwealth medal winners. Following a controlled heat swim in the morning, there was approximately five hours before the final at night. The race could not have come soon enough, because although I was experiencing intense nervousness, I was extremely excited and optimistic of a positive outcome. With minutes to go before the start, all eight teams were paraded along the poolside and introduced. My legs were shaking, and I felt a little sick but I had the intrinsic knowledge that I was capable of surpassing my personal best performance of 52.2 seconds for the event. I had no doubts at all about my state of readiness, either mental or physical. I was to swim the third leg of
the relay; however, observing the situation immediately prior to my leg it was evident our team was in fifth position. I can remember every detail of the race, and exactly how I felt at each point throughout. My confidence was justified, and I managed to complete my 100 metres in 51.4 seconds putting the team in the silver medal position which we subsequently held on to.

Despite the demands of both situations being of a similar nature, my responses were considerably different in terms of the consequences for performance. Specifically, both competitions were of a similar standard and the pressure to perform well was equally apparent. However, my pre-race anxiety symptoms in Hamburg were very much negative and debilitating in nature, but in contrast, very positive and facilitating towards the race prior to the competition at the World Challenge. It was following the first competition in Germany that my interest in sport psychology was stimulated, and somewhat inevitably directed towards the area of competitive anxiety. I was inquisitive about my own reactions to the anxiety I experienced and became interested in sport psychology and the study of anxiety. I developed a thirst for knowledge about the processes that underpin anxiety and why individuals react differently in pressure situations. Progressing from my intuitive interest in competitive anxiety, I wanted to delve deeper and acquire more knowledge by conducting research into competitive anxiety at a conceptual level.

Therefore, through subsequent competitive experiences, an increasing knowledge of sport psychology and research into anxiety, by the time I was in a similar pressure situation some years later, I had developed a range of psychological skills that enabled me to interpret the stress of the competition from a very different perspective. The desire to overcome personal competition anxieties had resulted in learning the reasons why I felt the way I did before important races. I experienced at first hand and understood the stress, pressure and anxiety associated with high standard competition from both a very negative and a positive perspectives.

1.2 THE STUDY OF ANXIETY IN SPORT

Although sport psychology is a relatively new academic discipline only coming to prominence since the early 1960's, it has since developed into an accepted and highly regarded world-wide academic area offering guidance to athletes coaches and all involved in competitive sport (Singer, 1993). Sport psychology, therefore, by its nature, not only strives to develop theoretical frameworks from which to study sports performers, but also attempts to apply knowledge practically for the benefit of the athletes. The study of stress and anxiety in sport has been a prominent research topic from the very beginnings of contemporary sport psychology. However, developments in competitive
anxiety research have been hindered by semantic confusion over terms such as 'stress' and 'anxiety' and 'arousal' and 'activation' which have often been used synonymously by researchers to refer to the same construct. This situation has been rectified somewhat, because very recently researchers have concentrated solely on the study of anxiety to explain relationships with performance and not confused the situation by also referring to the other constructs. This issue is complex and will be explored in detail in the following chapter (section 2.2).

Jones (1991) contended that the study of anxiety in sport can be useful in two broad directions; firstly, to generate knowledge about a complex phenomenon via the development of a sound knowledge base founded on theory and research; and secondly, by applying this knowledge practically to provide a high quality service to those participants who suffer uncomfortable and inhibiting symptoms of anxiety. Indeed, due to the significant part competitive sport now plays in modern life, there has been a rapid growth in the demand for sport science services in recent years. National teams have regularly turned to sports science in an attempt to enhance the performance of their athletes. Physiologists and biomechanists have been integral in this set up for many years; however, it is now widely acknowledged that sport psychologists can play a crucial role in the preparation of elite performers.

Considering the pressure associated with high level competition, it is not surprising, therefore, that a significant and ever increasing quantity of research in sport psychology has addressed the examination of competitive anxiety (Jones, 1995a). Early theoretical underpinnings were formerly borrowed from established literatures in educational, clinical and organisational psychology. In view of the considerable amount of attention directed towards anxiety, sport-specific anxiety theories were developed which contributed to the accumulation of credible and specific knowledge in the area. Indeed, the concept of anxiety has been subject to considerable refinement in recent years with developments in the measurement of the construct. Specifically, anxiety has progressed from a general to a situation specific response, from a trait to state reaction and most recently from a unidimensional to a multidimensional conceptualisation of anxiety.

Despite these developments, researchers are far from completely understanding the relationship between anxiety and sports performance. Sport psychologists have traditionally acknowledged that anxiety is a negative construct and will always affect performance detrimentally. However, a small amount of recent research has demonstrated that this may not always be the case and that anxiety can be facilitative and have positive performance consequences. Specifically, new dimensions to the anxiety response have been proposed including the notion of 'direction' which refers to the
interpretation of anxiety 'intensity' levels as either facilitative or debilitative towards the upcoming performance. Indeed, some early research by Mahoney and Avener (1977) demonstrated that elite performers interpreted anxiety as more facilitative than non-elite performers.

1.3 PURPOSE OF THE STUDY

The purpose of this thesis is to examine facilitative and debilitative competitive anxiety, and challenge the traditional conceptualisation that anxiety is invariably negative and debilitative towards sport performance. Specifically, the thesis examines: 1) differences in anxiety interpretations between elite and non-elite performers; 2) a control model which attempts to explain why individuals interpret anxiety differently; 3) how performers have acquired the ability to interpret anxiety symptoms as facilitative; 4) the effects of an intervention programme which attempts to alter interpretations from being debilitative to being facilitative.

1.4 STRUCTURE OF THE THESIS

This thesis comprises six ensuing chapters and addresses four main research questions. Each chapter provides a separate review of relevant literature associated with the study in addition to central review of literature. The specific outline of the thesis is as follows:

Chapter 2 reports a critical overview of the development of anxiety research and discusses advances in measurement of anxiety and the central issues addressed by researchers.

Chapter 3 (Study 1) reports an examination of intensity and direction dimensions of state anxiety in a sample of elite and non-elite sports performers. The purpose of the study was to investigate if the level and interpretation of anxiety symptoms is mediated by the individual difference variable of skill level.

Chapter 4 (Study 2) examines the predictions of a control process model developed by Jones (1995a), which predicts that performers' directional perceptions of anxiety will be a function of their goal attainment expectancies.

Chapter 5 (Study 3) reports an investigation into elite male competitive swimmers using structured interview techniques and an inductive analytic approach. The purpose of the
study was to examine the development of the cognitive skills and strategies that enable these performers to interpret their pre-competition anxiety symptoms as facilitative.

Chapter 6 (Study 4) examines the effects of a multimodal intervention programme on the directional perceptions of a small number of performers who, prior to the intervention, interpreted their pre-race anxiety symptoms as debilitative. The purpose, therefore, was to attempt to restructure negative interpretations of anxiety symptoms into more positive interpretations.

Chapter 7 summarises the findings of the research programme and attempts to draw the findings together in a theoretical discussion. The chapter also discusses the practical implications of the research, acknowledges the strengths and weaknesses of the studies, and suggests future research directions.
CHAPTER II

REVIEW OF LITERATURE

2.1 INTRODUCTION

This chapter provides a detailed review of the relevant issues in competitive anxiety research and is structured in the following way. Firstly, conceptual issues surrounding precise terminology in the research area are clarified. The review then discusses unidimensional arousal and unidimensional anxiety approaches to explain the relationship between anxiety and performance and appropriate developments in the measurement of anxiety. The main focus of this chapter discusses multidimensional anxiety issues including: antecedents; temporal patterning; the anxiety-performance relationship; and individual difference variables. The last section addresses criticisms of the multidimensional theory and a move towards assessing new dimensions to the competitive anxiety response including 'frequency' and 'direction' dimensions.

2.2 CONCEPTUAL ISSUES FOR CLARIFICATION

A central problem in the area of anxiety research surrounds the lack of precise definitions of terms such as 'arousal', 'activation', 'stress' and 'anxiety'. This lack of consensus within the literature has often resulted in major interpretative problems and a clouding of issues, particularly when the terms are used interchangeably to represent the same construct, despite their conceptual distinction (Gould & Krane, 1992). The following section addresses the four constructs which are most commonly interchanged in the research literature and provides working definitions for the remainder of the thesis.

2.2.1 AROUSAL AND ACTIVATION

Traditionally, researchers used labels such as 'arousal' and 'activation' to refer to a unidimensional construct which included both psychological and physiological characteristics, concerned primarily with the intensity of behaviour (Hardy, Jones & Gould, in press). Duffy (1962) defined arousal, for example, as "the extent of release of potential energy, stored in the tissues of the organism, as this is shown in activity or response" (p. 179).

However, researchers have criticised the conceptualisation of arousal as a unitary construct as too simplistic (Hockey & Hamilton, 1983; Jones & Hardy, 1989; Lacey, 2001).
1967; Neiss, 1988). Lacey (1967), for example, seriously questioned that arousal was unidimensional and argued that it was possible to distinguish between three different components: electrocortical (i.e. cognitive), referring to the degree of electrical activity in the cortex as measured by EEG; autonomic (i.e. somatic), referring to the degree of physiological activity taking place in the nervous system as examined by heart rate, blood pressure and skin conductance indices; and, behavioural arousal, referring to the overt activity of the individual. Lacey (1967) presented evidence for 'directional fractionation'; that is, the possibility for one of these three systems to be elevated, whilst activity in the other systems is depressed, therefore arguing that arousal is a multidimensional construct.

Recently clarifying the situation between arousal and activation, Hardy et al. (in press) adopted the definitions proposed by Pribram and McGuiness (1975). Specifically, clear distinctions are made between the cognitive and physiological activity that occurs in response to some unexpected input into the system (arousal), and the cognitive and physiological activity that is geared towards preparing a planned response appropriate to the current situation. Therefore, arousal is defined as the organism's phasic response to 'new' stimuli or input, and activation as the organism's tonic readiness to respond (Hardy et al., in press).

2.22 STRESS AND ANXIETY

As in the case in the previous section, 'stress' and 'anxiety' have also been used synonymously to refer to the same construct. Early definitions of stress treated it as both a stimulus (independent variable) and a response (dependent variable) (Cox, 1978). However, recent research favours the adoption of an interactional model which attempts to explain the relationship between stress and anxiety.

This relationship is summarised in Figure 2.1 which is adapted from Jones (1990), who operationalised stress following definitions by Cox (1978) and Lazarus (1966). Specifically, stress is referred to as a state in which some demand is placed on the individual, who is then required to react in some way to cope with the situation. Therefore, stress may, or may not impose 'strain' depending upon whether the individual perceives, via cognitive appraisal, that s/he is able to cope with the demands of the stressor in question (Jick & Payne, 1980; Lazarus, 1966).

2.1 'Strain' refers to the response to an individual's negative cognitive appraisal of his or her adaptation to the demands of the stressor (Jick & Payne, 1980; Jones, 1990).

2.2 'Stressors' refer generally to external factors which are potentially, but not necessarily, disturbing to the individual (Cherry, 1978).
The individual may experience a positive coping response if s/he is able to meet the demands of the stressor; however, if the individual doubts his/her ability to cope with the stressor, then feelings of 'anxiety' are likely to be the result. Therefore, as illustrated in Figure 2.1, the important factor is the individual's cognitive appraisal of his/her ability to cope with the demand placed on them by the stressor. Anxiety, therefore, may be referred to as any negative response to a stimulus, with stress being operationalised as that stimulus. Furthermore, the view of anxiety as a unitary phenomenon has also been challenged and heavily criticised; however, this issue forms the central focus of research discussed later in this chapter and will be addressed in detail in section 2.5 onwards.

Figure 2.1  Transactional Model of Stress and Anxiety
(Adapted from Jones, 1990)
In summary, research has been hindered by the lack of consistency with which terms such as stress, anxiety, arousal and activation have been employed. The previous discussion highlights that providing precise and accurate operational definitions is far from simple for these complex phenomena. For the purpose of this thesis, arousal and activation are complex multidimensional constructs, where activation is a state which reflects the individual's tonic readiness to respond, and arousal is the phasic response to new stimuli, and may affect performance positively or negatively by altering the individual's activation state (Hardy et al., in press). Stress refers to a state where some demand is placed on an individual who is then required to cope with the stressor. This then results in strain and subsequently feelings of anxiety if the individual appraises that they are unable to cope with the demand of the stressor. The main focus of this review of literature now concentrates specifically on the area of anxiety.

2.3 UNIDIMENSIONAL AROUSAL APPROACHES

Until recently, a considerable amount of literature which attempted to explain the anxiety-performance relationship has been dominated by arousal-based explanations. The most popular approaches have examined the relationship primarily via the predictions of unidimensional arousal theories such as drive theory and the inverted-U hypothesis. Unidimensional arousal essentially refers to a global undifferentiated arousal state which does not differentiate between separate mental and physical components (see section 2.21). The following section will review and critique these approaches and also discuss reversal theory which represents a more recent approach of the study of this relationship.

2.3.1 DRIVE THEORY

Drive theory (Hull, 1943), as modified by Spence and Spence (1966), was one of the first theories equated with the construct of arousal which has been used to explain the anxiety-performance relationship. Within this theory, drive was considered synonymous with arousal, and 'habit strength' was defined as the hierarchical ordering of correct and incorrect responses on a specific skill (whether the skill is well learnt or novel). The theory proposed how arousal (or drive) increases the probability of the dominant response occurring, and if this response is correct (i.e. when the skill is well learnt) then increases in arousal will result in performance enhancement in a positive linear fashion. Conversely, if the dominant response is incorrect (i.e. the skill is in the early stages of learning), increases in arousal result in decrements to performance. Drive theory, therefore, for correct responses normally depicts a positive linear relationship between the variables, where increases in arousal are accompanied by increases in performance.
Early research by Taylor (1956) and Spence and Spence (1966) supported the proposals of drive theory. However, sport psychologists have generally failed to support the early findings (Martens, 1971, 1974) and consequently criticised its proposals. The most poignant criticisms include: the difficulty of accurately measuring habit strength in applied sport settings (Mahoney & Meyers, 1989); and, the failure to consider the individual’s cognitive appraisal (Gill, 1994). Generally, the theory is considered too simplistic to explain complex human behaviour in motor or competitive sports performance (Fisher, 1976).

2.32 INVERTED-U HYPOTHESIS

The inverted-U hypothesis, also referred to as optimal arousal theory, is an alternative conception to drive theory which has received a considerable amount of research attention in the sport psychology literature to explain the relationship between anxiety and performance. The underpinnings of the theory originated in the research of Yerkes and Dodson (1908), who examined habit strength formation in mice, and subsequently the work conducted by Duffy (1932) and Hebb (1955). The theory postulates that increases in arousal are accompanied by increases in performance until an optimal point is reached. Thereafter, further increases in arousal are associated with decrements in performance which consequently results in a curvilinear relationship (an inverted-U) between arousal and performance.

Emanating from the basic premises of this theory, Oxendine (1970) proposed five states of optimal arousal suitable for different types of sports based on the energetical and physical requirements of those sports. For example, weightlifting and American football were categorised in an 'extremely excitable' category and, conversely, fine motor skills such as golf putting were classified in the 'slight arousal' category. Therefore, Oxendine's approach assumed that the point of optimal arousal decreases with increased complexity of the skill. Jones (1990) highlighted that although this approach is intuitively appealing, the classification is oversimplified in the assumption that one arousal level is indeed appropriate for all the skills within one particular sport. Furthermore, the cognitive requirements and decision-making mechanisms are unaccounted for in Oxendine's (1970) proposals.

Some support for the inverted-U hypothesis has been established in sport settings (Klavora, 1978; Martens & Landers, 1970; Sonstroem & Bernardo, 1982). For example, Martens and Landers (1970) examined the hypothesis utilising a tracing task which involved steadiness of arm movements as the performance measure. Findings revealed that the best performances were under moderate and not high or low stress conditions. Furthermore, Sonstroem and Bernardo (1982) reported that female college basketball
players scored the most points under moderate levels of trait and state anxiety with the worst performances being associated with high anxiety levels. However, despite the hypothesis receiving some empirical support in sport settings, this has not always been the case, and therefore, numerous criticisms have been directed towards optimal arousal theory. Indeed, Jones (1990) argued that in the new age of 'cognitive psychology' the hypothesis is a conceptual impediment. Researchers have argued that the assumptions underlying the hypothesis are inadequate to explain the arousal-performance relationship (Hardy, 1990; Jones & Hardy, 1989; Neiss, 1988). The principal criticisms of the theory in the sporting context include: 1) in some instances the theory has been used to 'explain' the arousal-performance relationship, while in others it has been used to 'describe' the relationship; 2) the symmetrical shape of the curve fails to support anecdotal evidence from sport psychology that overarousal results in considerable performance decreases which are difficult to rectify even to moderate levels. However, optimal arousal theory suggests that overarousal results in only small decrements to performance and therefore only a small intervention is required to regain optimal performance (Hardy, 1990); 3) the failure to explain why performance decrements can be observed at arousal level below the optimum (Eysenck, 1984; Landers, 1980); 4) the theory only relates to general effects on global performance rather than specific effects on subcomponents of performance (Hockey & Hamilton, 1983); 5) the relationship fails to take into account the multidimensional nature of the construct.

Generally, both drive theory and the inverted-U are too simplistic to explain the complex relationship between arousal and performance, and fail to account for the active role of the individual's cognitive appraisal of the situation (Gill, 1994). As alluded to previously, arousal is no longer viewed as a unidimensional construct and researchers accept that it incorporates at least separate cognitive and physiological components (Lacey, 1967). Furthermore, both drive theory and the inverted-U hypothesis are inadequate to address the anxiety-performance relationship with which they have been commonly associated.

2.33 REVERSAL THEORY

A further arousal-based approach2,3 which has proved valuable in furthering understanding in the area of anxiety and performance includes Kerr's (1989, 1990) application to sport of Reversal Theory (Apter, 1982).

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2,3 It should be highlighted that other arousal-based explanations have been developed and are prevalent in the literature (e.g. Easterbrook's, 1959 cue utilization theory; Hockey & Hamilton's, 1983 broad band approach; and, models by Humphreys & Revelle, 1984 and Sanders, 1983). In view of the fact that the focus of this literature review is directed towards anxiety, such theories will not be discussed; however, for a detailed review of these theories see Hardy et al. (in press).
In the theory, metamotivational states are hypothesised to exist together in pairs of opposites which may be subject to changes or psychological reversals. In a 'telic' metamotivational state, the performer is goal-directed and serious, and high levels of arousal are interpreted negatively. Conversely, in a 'paratelic' state the performer operates in a playful positive affect state that is enjoyable.

The experience of felt-arousal and hedonic tone; that is, the individual's interpretation of affect as either pleasant or unpleasant is most relevant to sports performance (Kerr, 1990). As illustrated in Figure 2.2, arousal levels can be interpreted in four different ways: high arousal can be interpreted as excitement which is pleasant in the paratelic state or anxiety which is unpleasant in a telic state; and, low arousal can be interpreted as boredom (unpleasant) in the paratelic state or relaxation (pleasant) in the telic metamotivational state. Therefore, in a paratelic state high arousal is preferred to experience excitement and in the telic state low arousal is preferred for the performer to experience relaxation. Reversals occur when there is a change from a telic to paratelic state or vice versa.

**Figure 2.2** Reversal Theory: Possible Options for Affecting Felt Arousal
(Adapted from Kerr, 1987)
Furthermore, Apter and Svebak (1990) proposed two different types of stress in reversal theory. Firstly, 'tension-stress' which occurs when there is a discrepancy between preferred and actual levels of arousal. This is postulated to occur when high levels of arousal are experienced in a telic state resulting in anxiety, or low levels of arousal in a paratelic state resulting in boredom. Secondly, 'effort-stress' which occurs when the individual attempts to reduce tension-stress. In the telic state, effort-stress is the result of attempting to reduce high levels of arousal, and in the paratelic state effort stress occurs when attempting to increase arousal.

From an applied perspective intervention strategies include not only regulating arousal levels (Figure 2.2; options 1 and 3), but also inducing psychological reversals from paratelic to telic states when tension-stress is caused by low arousal (option 1) and from telic to paratelic when tension-stress is caused by high arousal (option 2). Kerr (1987) suggested it is possible for performers to induce the necessary reversals via cognitive restructuring strategies and mental imagery techniques, although these propositions have not been examined to date.

Despite the potential important practical implications of reversal theory, the assumptions of the theory are complex and difficult to test which accounts for the few available studies (Kerr & Cox, 1990). However, this approach offers inviting alternatives to the inverted-U hypothesis; but, clearly a detailed programme of research is required to test the theory in competitive sports. Furthermore, the approach is limited somewhat by the unidimensional definition of arousal and anxiety which it utilises, and fails to recognise the separate mental and physical components (Jones, 1995a).

### 2.4 UNIDIMENSIONAL ANXIETY APPROACHES

Progressing from general arousal-based approaches to explain the relationship between anxiety and performance, the following section traces the developments of unidimensional anxiety and focuses on the advancements in measurement and the important distinctions that have emanated from this research. Unidimensional anxiety in the following section refers to a construct in which the partitioning of the response into separate cognitive and somatic components is ignored and anxiety is accepted as a global, undifferentiated response.

### 2.41 GENERAL VERSUS SPECIFIC ANXIETY

Conceptual advancements in anxiety research were hindered up until the 1950's by researchers' failure to distinguish between general and situation-specific anxiety responses. Specifically, researchers believed that anxiety was a generalised response across all stressful situations; however, evidence from other areas of psychology
suggested that anxiety is a situation-specific response and, therefore, anxiety responses should be sensitive to each different situations' unique characteristics. Mandler and Sarason (1952) examined anxiety as a non-unitary phenomenon in the area of educational psychology reporting that anxiety was a learned response to specific situations and constructed the 'Test Anxiety Scale'. Research using this questionnaire revealed it to be a better predictor of anxiety effects in academic achievement situations than general anxiety scales. Resulting from this research other situation-specific scales were developed to measure audience anxiety (Paivio & Lambert, 1959), social anxiety (Watson & Friend, 1969) and fear of snakes, heights and darkness (Mellstrom, Cicala & Zuckerman, 1976).

2.42 STATE VERSUS TRAIT ANXIETY

The second major development in anxiety measurement refers to the state-trait distinction which first emerged in the 1950's but is commonly credited to Spielberger (1966). This refers to the requirement to measure not only a general tendency to experience anxiety but also to examine anxiety responses at particular moments in time. Spielberger (1966) developed the 40 item State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch & Lushene, 1970) which measured both state and trait anxiety. State anxiety refers to the immediate emotional state of the individual, that is, the anxiety an individual experiences at one particular moment in time or on a moment by moment basis. Conversely, trait anxiety is the predisposition to experience anxiety in a range of different situations; it refers to the individual's usual or general anxiety response. Spielberger (1966) proposed that trait anxiety was an accurate predictor of state anxiety, so that, individuals high on trait anxiety would show greater increases in state anxiety when experiencing stress than individuals who generally respond with low levels of trait anxiety.

Early empirical findings suggested that Spielberger's questionnaire was useful for examining anxiety responses in sport (e.g. Martens & Gill, 1976; Tenenbaum & Milgram, 1978), but this research examined anxiety from a dispositional perspective, which failed to distinguish between different situations. As alluded to in the previous section (2.41), research has demonstrated that anxiety is a situation-specific response, so that anxiety measuring instruments should be sensitive to the unique situational characteristics of the environment (Mandler & Sarason, 1952; Mellstrom, Cicala & Zuckerman, 1976, Paivio & Lambert, 1959). Indeed, Spielberger concluded that: "in general, situation-specific trait anxiety measures are better predictors of elevation in A-state (state anxiety) for a particular class of stress situations than are general A-trait (trait anxiety) measures" (p.490). However, apart from the research conducted by Yuri Hanin discussed in the
following section, the STAI has not been employed in recent competitive anxiety research, primarily due to the non situation-specific properties it measures.

2.43 INDIVIDUAL ZONES OF OPTIMAL FUNCTIONING

Individual Zones of Optimal Functioning (IZOF) is an alternative approach to the study of the anxiety-performance relationship which takes into account individual differences rather than group comparisons (Hanin, 1980, 1989). Anxiety in this approach is measured via a modified version of Spielberger et al.'s (1970) STAI developed by Hanin and Spielberger (1983). According to Hanin, each athlete has an individual anxiety zone of optimal functioning (IZOF), and performance efficiency is at its greatest when the level of anxiety falls within this zone. Specifically, the IZOF theory predicts that one individual will perform to their optimum when experiencing high levels of anxiety, others when moderately anxious, and certain individuals when in a state of relaxation. Hanin's research suggested that the specific zone corresponded to the athlete's mean pre-competitive state anxiety score on the STAI plus or minus four points (approximately one-half a standard deviation). Initial evidence for the IZOF theory was based on the testing of Soviet performers over a large number of competitive trials. A correlation of 0.74 was established between the athlete achieving a successful athletic performance and the degree to which he or she was able to achieve their IZOF. Empirical support for IZOFs has been forwarded by Hanin (1980) and Morgan, O'Connor, Ellickson and Bradley (1988); however, despite the potential value of this approach, certain criticisms have been forthcoming, including: 1) the questionnaire used to measure anxiety was not situation-specific in nature; 2) IZOF is essentially an individual difference theory but without any individual difference variables (Gould & Tuffey, in press). Specifically, IZOF makes no attempt to identify factors which determine individual differences in IZOFs or explain how the zones affect performance; 3) the theory also fails to take into account the multidimensional nature of state anxiety (see section 2.51). However, in response to the last criticism a small amount of research has been carried out to examine IZOFs adopting a multidimensional approach yielding some encouraging early findings (Krane, 1993; Gould, Tuffey, Hardy & Lochbaum, 1993; see Gould & Tuffey, in press for a review).

2.44 SPORT COMPETITION ANXIETY TEST

In response to limitations of the STAI, Martens (1977) developed a trait measure of competitive anxiety called the 'Sport Competition Anxiety Test' (SCAT) which has received considerable attention in the sport psychology research literature. Martens described that "SCAT is an anxiety trait inventory designed to measure a predisposition
to respond with varying levels of anxiety state in competitive sport situations" (p.51). Martens (1977) reported that SCAT was a more accurate predictor of behaviour than the STAI, but more sensitive state inventories were still in need of development. The limited sensitivity of SCAT was illustrated in studies which established no differences between high and low trait anxious athletes on performance in laboratory studies (Martens, Gill & Scanlan, 1976; Murphy & Woolfolk, 1987). However, Martens (1990) reported that 88 empirical studies have adopted SCAT to examine competitive trait anxiety on research variables such as: general personality dispositions such as locus of control (Betts, 1982) and self-esteem (Passer, 1983); gender (Gill, 1988); age (e.g. Hogg, 1980; Power, 1986); and, ability (e.g. Power, 1982; Smith, 1983).

The large amount of research using SCAT, as highlighted by Jones (1995a), is surprising in view of the fact that although trait anxiety is useful in predicting state anxiety, it is of little use in directly predicting behaviour in competitive sports. Therefore, the more sensitive properties of state anxiety measures and the importance of the situation are prerequisites for more accurate anxiety response measurements.

2.45 COMPETITIVE STATE ANXIETY INVENTORY

In an attempt to develop a more sensitive measuring instrument, Martens, Burton, Rivkin and Simon (1980) modified the STAI and presented the 15 item Competitive State Anxiety Inventory (CSAI) as a sport-specific state measure of competitive anxiety. Research using the CSAI is limited because of developments in the conceptualisation of anxiety and the developments in appropriate measuring instruments. Therefore, the CSAI was soon superseded after its introduction; however, a number of studies using the CSAI established strong relationships between state and trait anxiety (using SCAT) in competitive sports (e.g. Cooley, 1987; Scanlan & Lewthwaite, 1984). As discussed in the next section, researchers began to acknowledge that anxiety is a multidimensional construct and not a unitary phenomenon.

2.5 MULTIDIMENSIONAL ANXIETY APPROACHES

This section discusses the progression in anxiety research from a unidimensional conceptualisation of anxiety towards a multidimensional approach. Developments in measurement instruments are examined, followed by the principal multidimensional research areas that have been investigated.

2.51 COGNITIVE AND SOMATIC ANXIETY

The development of the SCAT and CSAI aided understanding of knowledge in the area, but importantly, did not accommodate the recent developments taking place in
clinical and educational psychology areas at the time. Specifically, these developments demonstrated that anxiety was not a unidimensional, global, undifferentiated state, but a multidimensional construct, comprising at least cognitive and somatic components (Davidson & Schwartz, 1976; Liebert & Morris, 1967). Davidson and Schwartz (1976) and Liebert and Morris (1967) argued that it was not possible to accurately measure anxiety if it was continued to be viewed as a unitary state. Liebert and Morris, (1967) were the first researchers to advocate a multidimensional approach labelling the separate components of anxiety as 'worry' and 'emotionality'.

Morris, Davis and Hutchings (1981) conceptualised 'worry' as "the cognitive elements of anxiety, such as negative expectations and cognitive concerns about oneself, the situation at hand and potential consequences" (p.541); and 'emotionality' as "one's perception of the physiological-affective elements of the anxiety experience; that is, indications of autonomic arousal and unpleasant feeling states such as nervousness and tension" (p.541). Davidson and Schwartz (1976) identified two similar components to that presented by Morris et al. (1981) which were referred to as cognitive anxiety (worry) and somatic anxiety (emotionality) which are the terms adopted in multidimensional competitive anxiety research today. Borkovec (1976) also identified a third dimension to the multidimensional anxiety response which he labelled the 'overt behavioural' component which tends to be assessed in contemporary multidimensional anxiety literature as performance. Subsequently, both trait (Cognitive Somatic Anxiety Questionnaire; Schwartz, Davidson & Goleman, 1978) and state (e.g. Worry-Emotionality Inventory; Morris et al., 1981) questionnaires were developed supporting the delineation of anxiety into its separate components.

Liebert and Morris (1967) proposed that these separate components are elicited by different antecedents and will therefore influence behaviour differently. Specifically, one individual may respond to a stressor with primarily a cognitive response, while another individual might respond to the same situation with greater levels of somatic anxiety. However, although each anxiety state is hypothesised to be conceptually independent, Morris et al. (1981) highlighted that they are likely to covary in stressful situations because each situation contains elements related to the arousal of each component. Indeed, Borkovec's (1976) belief is that each component of anxiety may serve a conditional function for the other. Thus, the components may interact in such a way that changes in one response system may ultimately affect changes in the other component. Relating to this contention is the ongoing controversy regarding primary cognition versus affect in the human experience (Lazarus, 1984; Zajonc, 1984). Specifically, the debate centres around whether cognition or affect 'comes first' as the prime mover. Lazarus (1984) argued the emphasis on the pervasiveness of cognitive appraisal in human
emotional experiences; however, Zajonc (1984) defended emotional responding as the prime mover.

A considerable body of empirical evidence exists which supports the delineation of the anxiety response into separate cognitive and somatic components. Firstly, Morris and Liebert (1973) provided evidence that the components are elicited by different antecedents, in that, failure feedback elevated cognitive and not somatic anxiety; however, the threat of electric shock elevated somatic anxiety and not cognitive anxiety. Furthermore, Morris et al. (1981) reported that cognitive anxiety was elevated by social evaluation but somatic anxiety remained unaffected. Secondly, the different components have different effects on performance. Specifically, Morris and Liebert (1969) provided evidence that cognitive anxiety (worry) affects intellectual performance to a greater extent than somatic anxiety (emotionality); however, somatic anxiety may effect motor performance to a greater degree than cognitive anxiety. Thirdly, the separate components may be reduced via different anxiety reduction techniques. For example, Schwartz et al. (1978) reported that regular exercise was associated with decreases in trait somatic but not trait cognitive anxiety; however, regular meditation practice reduced trait cognitive anxiety but not trait somatic anxiety. The last line of evidence supporting the separation of anxiety into cognitive and somatic components is the fact that the components exhibit different temporal characteristics. Specifically, cognitive anxiety remains stable in the lead up to an event, but somatic anxiety increases rapidly at the start of an event but then dissipates once the event has commenced (Doctor & Altman, 1969; Morris & Fulmer, 1976; Spiegler, Morris & Liebert, 1968).

2.52 COMPETITIVE STATE ANXIETY INVENTORY-2

Responding to the advances in anxiety research in the educational and test literature's Martens, Burton, Vealey, Bump and Smith (1982, 1990) eventually revised the CSAI and developed the Competitive State Anxiety-Inventory-2 (CSAI-2), which measures cognitive anxiety, somatic anxiety and self-confidence. Cognitive anxiety refers to the mental component of anxiety and is characterised by fear of failure and negative expectations about performance. Somatic anxiety refers to the individuals' perceptions of their physiological state in response to the stressful situation that they find themselves in. Specifically, symptoms associated with somatic anxiety include increased perspiration, heart rate and muscle tension. The questionnaire also measures a third component called self-confidence which will be discussed in more detail in the following section which discusses the development of the inventory.
2.521 Development of the CSAI-2

The CSAI-2 was originally constructed by Martens and associates to measure fear of physical harm and a generalised anxiety component in addition to the cognitive and somatic scales. Form A of the questionnaire was reduced from 102 items to 79 items and was administered to 106 American collegiate footballers one hour prior to competition. Factor analysis of the questionnaire revealed the emergence of the three out of the four factors with the generalised component failing to emerge from the analysis. Additional iterative factor analysis revealed that cognitive anxiety was shown to dissociate into two components: negatively phrased items (cognitive anxiety); and, positively phrased items, formerly thought to be part of the cognitive scale, which were subsequently labelled self-confidence.

Following this development, the inventory was revised to produce Form B which comprised 36 items including cognitive anxiety (12 items), somatic anxiety (12 items), self-confidence (10 items) and fear of physical harm (2 items). Additional refinements eventually led to the final version of the CSAI-2 which researchers utilise today (Form E) which included 9 items in each of the three subscales of cognitive and somatic anxiety and self-confidence.

In view of the fact that self-confidence emerged in the developmental process of the CSAI-2, it has received attention in a considerable number of publications. Indeed, the emergence of self-confidence in the construction of the CSAI-2 led Martens and his colleagues to postulate that cognitive anxiety and self-confidence represent the opposite ends of a cognitive evaluation continuum. Therefore, elevated levels of cognitive anxiety are associated with low levels of self-confidence and vice versa. However, temporal design studies (e.g. Jones & Cale, 1989b; Jones, Cale & Kerwin, 1988) and antecedent investigations (Jones, Swain & Cale, 1990; Hanton & Jones 1995) support the relative independence of the self-confidence component. Also, correlational analysis demonstrated low correlations between anxiety and confidence (e.g. Gould, Petlichkoff & Weinberg, 1984; Martens et al., 1990). Parfitt, Jones and Hardy (1990) further highlighted that as the CSAI-2 components were extracted orthogonally in the factor analysis, it is incorrect to situate them at opposite ends of the same continuum.

2.53 SPORT ANXIETY SCALE

The most recent development in multidimensional measurement of anxiety has been the development of the Sport Anxiety Scale (SAS) (Smith, Smoll & Schutz, 1990).

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2.4 The psychometric properties of the CSAI-2 and additional descriptions of items will be discussed in Chapter 3 (Study 1; section 3.421)
The scale, which is a measure of trait anxiety in competitive situations, includes three subscales of the individuals' tendency to worry, experience somatic responses and experience disruptions in concentration during competition. Jones (1995a) expressed that although reporting impressive psychometric properties, the SAS is in its relative infancy and therefore only a very scant amount of empirical research employing this scale actually exists (Krane, Joyce & Rafeld, 1994).

2.54 MULTIDIMENSIONAL COMPETITIVE ANXIETY RESEARCH AREAS

The vast majority of research into multidimensional competitive state anxiety has addressed the pre-competition period. Silva and Hardy (1984) explained why this period has received such a large amount of research interest: 1) the assumption that the athlete's mental set prior to competition can affect subsequent performance; 2) the assumption that the athlete has some control over his or her mental preparation during this period; 3) at a practical level the period preceding competition is more accessible to researchers than the time during the competition itself; 4) if pre-competition anxiety is a negative source of performance variance then the applied sport psychologist can assist in developing an appropriate pre-performance state.

The following section, therefore, discusses central research issues in the area of multidimensional competitive anxiety including: antecedents; temporal patterning; anxiety during performance; multidimensional anxiety and performance; and, individual difference variables.

2.541 Antecedent Research

Jones and Hardy (1990) have noted that antecedents research has received little attention in the research literature. This is surprising in view of the fact that the identification of the precursors of anxiety should facilitate the implementation of appropriate intervention strategies and aid the search for optimal performance states. The literature has tended to be dominated by stress management models which emphasise the reduction of anxiety symptoms, normally via relaxation techniques. However, researchers and sport psychologists alike would benefit from the identification of what actually causes the anxiety to be manifested in the first place.

Since the 1970's a substantial body of literature has developed in an attempt to identify the sources of unidimensional stress, primarily in younger athletes (e.g. Cohn, 1990; Gould, Horn & Spreeman, 1983a; Hanson, 1967; Lowe & McGrath, 1971; Pierce & Stratton, 1981; Scanlan, 1984; Scanlan & Lewthwaite, 1984; Scanlan & Passer, 1978, 1979). For example, Pierce and Stratton (1981) surveyed 543 youth sports participants and established that 'not playing well' and 'making mistakes' were their biggest worries.
Also, parental, coach and teammates reactions to performance emerged as sources of stress. Furthermore, Gould et al. (1983a) investigated junior elite wrestlers (n=458) and identified antecedents such as 'performing to one's ability', 'improving on one's prior performance', 'participating in championship standard meets', 'not wrestling well' and 'losing'. Feltz, Lirgg and Albrecht (1992) also established similar sources of stress to Gould et al. (1983a) with young distance runners.

Martens et al. (1990) argued that possibly the greatest evidence for the independence of the subcomponents of the multidimensional anxiety response was the identification of the different antecedents associated with cognitive and somatic state anxiety. Martens et al. (1990) hypothesised that the situational antecedents of cognitive anxiety and self-confidence are those factors in the environment which relate to the performer's expectations of success, such as the competitor's perceptions of their own and their opponents ability, and expectations of success. The antecedents which result in increased somatic anxiety are thought to be non-evaluative, of shorter duration and mainly consist of conditioned responses to environmental stimuli. Gould et al. (1984) and Martens et al. (1990) illustrated these to be pre-competition warm up routines, match importance, social facilitation effects, locker room preparation and entering the performance environment. However, to date, only a limited body of research exists utilising a multidimensional perspective (e.g. Gould et al., 1984; Hanton & Jones, 1995; Jones et al., 1990, 1991; McAuley, 1985a). Gould et al. (1984) examined 37 collegiate wrestlers over two competitive matches and established that years of experience was the strongest predictor of cognitive, but not somatic anxiety, in both matches. Jones et al. (1990) examined the antecedents of 125 elite male middle-distance runners. Results revealed that cognitive anxiety and self-confidence were predicted by a factor relating to performance expectancies; however, no predictors of somatic anxiety emerged. Jones et al. (1991) further reported that antecedents may also differ as a function of sex when they investigated male and female collegiate athletes. The results suggested that significant predictors of cognitive anxiety and self-confidence in females were personal goals and standards, but cues predicting cognitive anxiety in males were associated with interpersonal comparison and winning. Furthermore, recent findings suggest that antecedents also differ as a function of type of sport in an investigation of elite competitive swimmers (Hanton & Jones, 1995). Results established partial support for Jones et al.'s (1990) findings, in that cognitive anxiety and self-confidence were also predicted by a 'perceived readiness' factor which related to the athletes' performance expectancies. Findings from these studies indicated only partial support for the predictions of Martens et al. (1990), in that, although cognitive anxiety and self-confidence have been shown to share common antecedents relating to expectations of
performance, factors have also emerged that are unique to each. Thus, these results accentuate the need to examine antecedents at not only an individual sport but also at an individual person level.

In addition to the quantitative antecedent investigations, a number of sources of anxiety have been uncovered in qualitative interview-based studies with elite performers (Gould, Ecklund & Jackson, 1990; Gould, Jackson & Finch, 1993a; Scanlan, Stein & Ravizza, 1991). These studies are interesting in view of the fact that they have started to unearth some of the organisational and occupational stressors associated with elite level performance (Hardy & Jones, 1994), and direct attention towards important future research in the area of antecedents. The findings from the qualitative studies are discussed in greater detail in the review of relevant literature in Chapter 5 (Study 3; section 5.221)

2.5.42 Temporal Patterning

One line of enquiry using the CSAI-2 that has received considerable attention has involved the examination of fluctuations in cognitive and somatic anxiety and self-confidence during the period leading up to competition. This research has generally supported the relative independence of the multidimensional components and therefore the construct validity of the CSAI-2. However, some temporal studies have reported moderate intercorrelations between the components indicating some covariance (Gould et al., 1984; Karteroliotis & Gill, 1987). Jones (1995a) therefore, suggested that an avenue for future research is the examination of the interplay between cognitive and somatic anxiety during the pre-competition period.

Martens and colleagues (1990) developed theoretical predictions for the temporal patterning of the CSAI-2 subcomponents in the period preceding competition which were based on findings from the test anxiety literature. Specifically, it was proposed that somatic anxiety would be considerably lower than cognitive anxiety several days prior to competition, but would show a drastic initial increase on arrival at the competition venue and then dissipate once competition had commenced. Cognitive anxiety and self-confidence, on the other hand were predicted by more enduring responses and remain stable as long as the performer's expectations of performance remained unchanged (see Figure 2.3)

2.5 Early temporal patterning research examined anxiety from a unidimensional perspective, primarily focusing on physiological indices of elite versus less elite performers. This research is reviewed in Chapter 3 (Study, 1; section 3.2111).
Studies have generally supported Martens' theoretical predictions for cognitive anxiety and somatic anxiety (Jones & Cale, 1989a; Jones et al., 1988; Parfitt, 1988; Parfitt & Hardy, 1987); however, they have been far from consistent. McAuley (1985a) for example, found that during a round of competitive golf, cognitive anxiety was higher at the half way stage than at the onset of the round, while somatic anxiety was significantly lower.

Findings concerning the temporal characteristics of self-confidence have been less consistent (Gould et al., 1984; Jones & Cale, 1989a; Jones et al., 1988; Parfitt & Hardy, 1987, Swain & Jones, 1991). Specifically, Jones et al. (1988) examined cricket batsmen in a time-to-event study and established support for the cognitive and somatic components, but self-confidence was shown to decrease prior to competition. Furthermore, Swain and Jones' (1991) study established decreases in self-confidence on the day of competition in 60 male track athletes.

The temporal patterning of the CSAI-2 response has additionally been shown to vary as a function of individual difference variables such as type of sport (Krane & Williams, 1987; Martens et al., 1990), sex (Jones et al., 1991), gender role (Swain & Jones, 1991), competitiveness (Swain & Jones, 1992) and skill level (Martens et al., 1990). The practical significance of examining the anxiety responses in the lead up to a competition relate to the fact that if appropriate intervention strategies are to be implemented it is essential that they are developed at an individual level. The temporal patterning of anxiety as a function of skill level will be further discussed in the first study in this thesis (Chapter 3, Study 1; section 3.211).
2.543 Anxiety During Performance

As alluded to previously, researchers have tended to concentrate on the pre-competition period to examine performers' anxiety responses (Silva & Hardy, 1984). Therefore, a considerable lack of research is available regarding anxiety responses during performance. Only a scant amount of research has addressed this issue via examining the retrospective responses of performers following the competition (Martens et al., 1990; McAuley, 1985a); however, the validity and accuracy of such approaches is in question.

The investigation of anxiety during performance is constrained by the lack of appropriate measuring instruments, since self-report measures are not suitable or practical for such purposes. Single-item self-report measures could be used in sports such as tennis and golf that allow their completion during rest periods. Initial research along this line of enquiry has been encouraging (Krane et al., 1994; Hardy, in press) with impressive psychometric properties of preliminary scales being reported. However, in sports where even single-item responses are inappropriate, several other approaches would appear to be of value in advancing knowledge in this area: 1) psychophysiological studies measuring heart rate and EEG traces (e.g. Collins, Powell & Davies, 1990, 1991); 2) autonomic nervous system (ANS) and cerebral asymmetry studies (Davidson, 1992; Levenson, 1992); 3) studies examining physiological differences as a result of negative emotions (e.g. Roberts & Weerts, 1982; Waters, Bernard & Buco, 1989), and positive emotions (Levenson, 1992); studies investigating the hemispheric substrates of emotion (Davidson, 1992); and, startle probe response research (Lang, 1985).

Jones (1995a) reviewed these approaches in greater detail, and highlighted that the research may offer some answers as to how sport psychologists might address the challenging area of anxiety during performance in the future. Jones further recognised, however, the problems of intrusiveness associated with these methods and consequently concerns with ecological validity in such work.

2.544 Multidimensional Anxiety And Performance

Researchers in educational psychology advocated that cognitive anxiety is the major influence on performance because it disrupts the attentional process directing attention away from task-relevant cues and therefore uses up the individuals information processing resources (Spiegler et al., 1968; Wine, 1980). Conversely, the somatic component is thought to have less consistent effects on performance due to lack of interference with task-relevant thought processes.

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2.6 Jones (1995a) highlighted, that these measures may be somewhat limited in terms of the precise measurement of the performers cognitions.
Martens et al. (1990) predicted that somatic anxiety should influence performance to a lesser extent than cognitive anxiety because anxiety associated with physiological responses should reach its peak at the onset of competition and then dissipate. Cognitive anxiety should remain elevated during the competition due to social evaluation and the fluctuating expectancies of the outcome of the competition. The following sub-sections discuss: the relationship between the separate CSAI-2 components and performance; criticisms of this research; studies examining the effects of subcomponents of performance and finally the most recent developments of catastrophe theory to explain the multidimensional anxiety-performance relationship.

### 2.5441 Relationship Between CSAI-2 Components and Performance

A considerable amount of research exists using the CSAI-2 in an attempt to examine the relationship between the subcomponents and performance; however, the findings have been somewhat equivocal. Martens et al.'s (1990) theoretical predictions as part of the construct validation of the CSAI-2 hypothesised that: 1) a negative linear relationship would exist between cognitive anxiety and performance; 2) a curvilinear inverted-U relationship would exist between somatic anxiety and performance; 3) the relationship with self-confidence would be positive and linear.

Martens et al.'s (1990) initial work in this area was unable to predict golf performance from the CSAI-2 subcomponent scores, but acknowledged that the performance measures used may not have been sensitive enough for predictive purposes. Gould et al. (1984) investigating college wrestlers established that the only predictor of match outcome was cognitive anxiety. A similar pattern of results was uncovered by Barnes, Sime, Deinstbier and Plake (1986) who found that cognitive anxiety but not somatic anxiety was a predictor of competitive swimming performance. Maynard and Howe (1987) examined a sample of university rugby players but failed to established a relationship between any of the sub-components and performance. Other studies which have also failed to predict performance from any of the CSAI-2 components include (e.g. Karteroliotis & Gill, 1987; Krane, Williams & Feltz, 1992; Martin & Gill, 1991).

### 2.5441.1 Criticisms of Anxiety-Performance Research

As is evident from the previous sub-sections, the relationship between anxiety and performance has proved elusive to investigate. Gould, Petlichkoff, Simons and Vevera (1987) argued that the lack of consistency in the research may be attributed to methodological, design and analysis problems which included: 1) research had been over-reliant on between-group, cross-sectional designs as opposed to within-subjects, longitudinal designs. Thus, the use of intraindividual analyses (Sonstroem & Bernardo,
1982) as a methodological development was advocated; 2) inappropriate statistical techniques were typically employed that were not capable of detecting curvilinear relationship between variables; 3) the operational definitions of performance have tended to be insensitive and rather global in nature (e.g. win/loss, performance time, outcome position). These performance measures were not sensitive enough to detect slight changes in performance, and consequently researchers were urged to adopt standardised performance measures.

Following these recommendations, Gould et al. (1987) established an inverted-U relationship between somatic anxiety and performance in a sample of 39 pistol shooters: however, no relationship emerged between cognitive anxiety and performance. Also, self-confidence was related to performance but in a negative linear fashion which the authors explained from a lack of ego threat in the competitive situation. As Swain and Jones (1996) explained, this was the first study where somatic anxiety had accounted for more variance in performance than cognitive anxiety, possibly as a result of the fine neuromuscular control required in pistol shooting. Furthermore, Burton (1988), administered the CSAI-2 to two separate samples of competitive swimmers prior to competition with performance data being collected from official result sheets. Adopting an intraindividual longitudinal design and polynomial trend analysis, Burton (1988) supported the predictions of Martens et al. (1990). Specifically, an inverted-U relationship was established between somatic anxiety and performance, and negative and positive linear relationships for cognitive anxiety and self-confidence respectively.

However, although encouraging support was established by Gould et al. (1987) and Burton (1988), other studies have failed to produce such supporting results (e.g. Bird & Horn, 1990; Krane, 1990). Therefore, despite advances in the methodologies employed, findings were still far from consistent. Other possible reasons for the inconsistencies pertain towards failing to control for individual differences in skill and ability, response sensitivity, and importantly the failure to consider athletes' interpretations of their anxiety symptoms in terms of consequences for performance (see section 2.5522).

2.54412 Subcomponents of Performance

As alluded to previously, one possible reason for the lack of explained variance in the anxiety-performance relationship may have been the result of insensitive global performance measures. Hockey and Hamilton's (1983) 'Cognitive Patterning of Stress States' theory proposed that to understand stress, the focus should be on the effect of different stressors on many performance patterns which consequently revealed differing stress states. This has been acknowledged as a worthwhile approach despite the
limitation of adopting a unidimensional perspective on anxiety (Jones & Hardy, 1990). Therefore, some recent research has been directed towards examining anxiety effects on the subcomponents of performance (Jones & Cale, 1989a, in press; Jones et al., 1988; Jones & Hardy, 1989; Parfitt & Hardy, 1987, 1993). Specifically, Parfitt and Hardy (1987) established improvements in working memory associated with elevated levels of cognitive anxiety in basketball players. Jones et al. (1988) examined the relationship between competitive state anxiety and simple and discriminant (SRT and DRT) reaction time tasks in twelve cricket batsman. The found that elevated levels of somatic anxiety were associated with low self-confidence and errors in DRT. Furthermore, Jones and Cale (1989a) examined the relationship between anxiety and cognitive and motor subcomponents of performance in two groups of hockey players and established a positive relationship between somatic anxiety and perceptuo-motor speed. The studies have illustrated the utility of addressing the separate components of performance as opposed to solely global measures of performance. Also, some of these studies suggest that elevated levels of anxiety do not necessarily result in performance decrements. This line of research is discussed further in section 2.5522.

2.54413 Catastrophe Theory

Catastrophe theory (Fazey & Hardy, 1988; Hardy, 1990) represents a behavioural modification of Thom's (1975) mathematical model and Zeeman's (1979) social science application, and represents the most recent attempt in the literature to clarify the relationship between multidimensional anxiety and performance. Hardy and colleagues explained that instead of examining the separate effects of cognitive and somatic anxiety on performance as typified in section 2.5441, research should be directed towards examining the interaction of the subcomponents of anxiety on performance. In view of the fact that this chapter is not intended to directly focus on catastrophe models, a full explanation of the theory is beyond this section; however, see Hardy, 1990 and Hardy (in press) for more detailed discussions of catastrophe theory.

Initially, Hardy and Fazey (1987) introduced a two-dimensional catastrophe model into the literature resulting from concerns with the face validity of the inverted-U curve. Specifically, in contrast to the progressive decrease in performance advocated by optimal arousal theory when arousal increases beyond the optimum, catastrophe theory hypothesised a sudden drop in performance at this point of overarousal. Progressing from this model, Fazey and Hardy (1988) further developed the theory towards a three-dimensional cusp catastrophe model that accommodated the predictions of interaction between the variables (see Figure 2.4)
In the model represented in Figure 2.4 physiological arousal represents the normal factor (variable in which increases are associated with increases in the dependent variable) and cognitive anxiety represents the splitting factor (factor which determined the effects of the normal factor on the dependent variable) which is hypothesised to mediate the effects of physiological arousal on performance (the dependent variable). Fazey and Hardy (1988) decided to incorporate an objective measure of physiological arousal for the purposes of catastrophe theory as opposed to the more commonly referred to 'somatic anxiety' which refers to the perception of physiological arousal.

Catastrophe theory, therefore, predicts that cognitive anxiety directly influences performance as well as mediating the effects of physiological arousal. Specifically, the model predicts that increases in cognitive anxiety will have positive effects on performance when physiological arousal levels are low, but negative effects on performance when physiological arousal levels are elevated. Also, when cognitive anxiety is low, a gentle inverted-U relationship between anxiety and performance will exist. However, when cognitive anxiety is high, performance level increases with increases in physiological arousal until a critical threshold is reached. Further increases in physiological arousal will lead to a large and sudden decline in performance (a performance catastrophe). Therefore, performance drops significantly from the upper to the lower performance curve. Once this occurs, only significant reductions in
physiological arousal can start to slightly improve performance once again to a reasonable level. Furthermore, the two opposing performance curves denote a state in which physiological arousal is increasing (upper curve) and decreasing (lower curve). Hardy and colleagues referred to this state as 'hysteresis', the result of which is called a 'bifurcation set' (i.e. the same level of physiological arousal is associated with two different levels of performance depending on whether physiological arousal is increasing or decreasing). One further development in this line of research was the advancement of the five-dimensional butterfly catastrophe model which incorporates a self-confidence component. Hardy (in press) recognised however, that testing the predictions of this model would be complex.

Empirical support for the predictions of catastrophe theory are limited in view of the complexity of the theory. However, some studies have found general (but not unequivocal) support for the hypotheses of the model in basketball, bowls and softball (Hardy & Parfitt, 1991; Hardy, Parfitt & Pates, 1994; Krane et al., 1994).

Despite the potentially exciting future findings that may emanate from pursuing catastrophe models, certain criticisms have been levelled at the theory. Gill (1994) criticised the model's complexity and oversophistication, arguing that it had little applied relevance to sport. However, Jones (1995a) contended that the early findings are encouraging despite the approach being in its infancy, and that complex theoretical issues are a prerequisite if development of knowledge is to be forthcoming. This is particularly important in research areas such as the examination of the relationship between anxiety and performance where advancements have been slow to develop in recent years.

### 2.545 Additional Individual Difference Variables

Martens et al. (1990) highlighted certain other individual difference variables that may mediate the competitive state anxiety response. Specifically, Martens et al. (1990) postulated that athletes competing in individual sports, subjective sports and/or contact sports would elicit greater intensities of cognitive anxiety and less self-confidence than performers in team sports, objective sports and/or non-contact sports. Furthermore, Martens predicted that there would be no differences between either individual versus team performers and subjective versus objective sports performers on somatic anxiety; however, performers in contact sports would elicit higher levels of somatic anxiety than participants in non-contact sports.

2.7 In studies carried out by Hardy and Parfitt (1991) and Hardy et al. (1994), physiological arousal was manipulated by means of physical exercise and operationalised as heart rate.
The rationale behind these predictions were: 1) threat of evaluation in individual sports is maximised; 2) in subjective sports the performers lack direct control over the performance outcome; 3) in contact sports, athletes show higher anxiety and lower confidence due to the increased threat arising from personal confrontation. In the construct validation research on the CSAI-2 full support for these hypotheses was established for the contact/non-contact predictions and the subjective/objective predictions. Partial support was found for the individual/team predictions, in that, performers in individual sports did elicit higher cognitive anxiety and lower self-confidence than performers in team sports; however, the individual performers also elicited greater levels of somatic anxiety, possibly due to the different arousal demands of the sports chosen for comparison in the research.

A further individual difference variable acknowledged as an important interpersonal factor in competitive sport is that of sex (Gill, 1988). Studies have shown that females report higher pre-competition anxiety levels and lower confidence levels than males. This is possibly due to the traditional socialisation of the sexes favouring males in terms of preparation for competition (Anderson & Williams, 1987). However, Briscoe (1985) suggested that differences may be due to females showing an increased willingness to portray their feelings, particularly unpleasant feelings such as anxiety.

Jones and Cale (1989b) reported that females and males reported different levels of anxiety in a time-to-event study. Specifically, a mixed sport-type sample (n=40) completed the CSAI-2 at six stages prior to competition. The females demonstrated increases in cognitive and somatic anxiety and decreases in confidence as the competition neared. Conversely, supporting the theoretical predictions of Martens et al. (1990), males reported no change across time for cognitive anxiety, stable self-confidence and a sharp increase in somatic anxiety as the competition was about to start. Therefore, there appears to be a number of other individual difference variables which mediate the cognitive anxiety, somatic anxiety and self-confidence components in competitive anxiety research.

### 2.55 CRITICISMS OF MULTIDIMENSIONAL ANXIETY THEORY

The following section discusses some criticisms of multidimensional anxiety theory including: the nature of the anxiety response; the weaknesses in the measurement of the construct; and, therefore, new dimensions of the competitive anxiety response including the frequency of cognitive intrusions and facilitative versus debilitative anxiety states.
2.551 Nature of the Multidimensional Response

Jones (1995a) recognised that although research using the CSAI-2 has considerably increased knowledge in the area of competitive anxiety in sport, the multidimensional conceptualisation of anxiety into its separate cognitive and somatic components has been subject to recent criticism by Landers (1994). As Landers contended:

"Although the partitioning...once sounded appealing (Landers, 1980), fundamental conceptual problems and lack of empirical support have greatly reduced my enthusiasm. The multidimensional model, as it has been operationalized for use in our field, promotes the separation of mind (cognitive anxiety) and body (physiological or somatic/arousal anxiety). This Cartesian dualism is no longer viewed as consistent with the findings of contemporary neuroscience" (Churchland, 1989, p.127-128).

In response to this criticism, Jones (1995a) discerned that Landers failed to acknowledge a substantial body of research which has supported the value of measuring the separate components. Furthermore, accepting that there is a degree of interplay between the two components as formerly recognised by Morris et al. (1981), Jones (1995a) argued that this reason alone is not substantial enough to abandon the approach. Jones continued to argue that the alternative 'physicalist' neuroscience approach is still in its infancy and fails to forward a model to explain behaviour (Churchland, 1980), and is therefore unlikely to be of help to sport psychologists in the future. Indeed, the previous review of literature highlights the wealth of information that the multidimensional conceptualisation of anxiety has generated.

2.552 Weaknesses in Measurement: New Dimensions to the Anxiety Response

Although defending the conceptualisation of the multidimensional model, Jones (1991, 1995a) has recently criticised the somewhat limited measurement dimensions of the anxiety response. Specifically, the most recent development in the area of competitive anxiety research has been the recognition that the anxiety response may have more dimensions than simply the level or 'intensity' of cognitive and perceived physical symptoms which are deemed to reflect the presence of anxiety. The CSAI-2, which has been and continues to be the most prominent measuring instrument available, is limited in that only the level or intensity of what are purported to be anxiety symptoms are measured. It fails to assess what has been labelled as 'directional perceptions' by Jones and associates, or the 'frequency' of cognitive related intrusions. The following two sections of this review discuss in greater detail these two new dimensions to the competitive anxiety response.
2.5521 Frequency of Cognitive Intrusions

The first additional dimension in this area has been the measurement of 'frequency' of the competitive anxiety response, operationalised as the proportion of time during which cognitions about the upcoming competition occupy the performer's thoughts. Referring to the temporal patterning of the CSAI-2 components, it is predicted that cognitive anxiety remains constant as the event nears; however, this is only the level or intensity of the response as traditionally measured via the CSAI-2. Jones (1991) discerned that from one week to one day prior to the competition, the performer may well experience the same 'intensity' of anxiety, but one week prior the performer would without doubt experience these cognitions less frequently than one hour before. These proposals have been examined recently in empirical studies by Swain and Jones in 1990 and 1993.

Swain and Jones (1990) in the first of two studies, examined 60 male collegiate track athletes via a modified version of the CSAI-2. Specifically, the questionnaire included a single 'percentage thinking time' item. Results revealed that the amount of time the performers spent thinking about the competition increased from a mean of 5.7% one week before to 82.4% one hour before competition. Follow-up interviews substantiated these quantitative data, showing that cognitive states do change in the period leading up to a competition. In a second study, 49 track and field athletes completed a modified version of the CSAI-2 at four different temporal stages prior to competition (2 days, 1 day, 2 hours and 30 minutes). The CSAI-2 included the original intensity scale but instead of a single percentage thinking time item used in the first study, also a frequency scale which asked the athlete to rate "How frequently are you experiencing this thought/feeling at this stage". Responses on the frequency scale ranged from 1 ("not at all") to 7 ("all of the time"). Findings revealed that cognitive anxiety intensity only increased at the last stage (30 minutes); however, frequency scores increased from 25.49 to 40.13 from two days to thirty minutes prior to competition. Most recently, Swain and Jones (1993) reported that although the intensity of cognitive anxiety did not alter from one week before competition to one hour prior to competition in a sample of track and field athletes, the frequency with which the symptoms were experienced increased considerably over that period. Cognitive anxiety symptoms were experienced 5% of the time one week before and 90% of the time one hour before competition. Therefore, although the intensity of cognitive anxiety did not change over the one week period, the cognitive symptoms were experienced more frequently as the competition approached. Similar findings were not, however, reported for somatic anxiety and self-confidence. Specifically, somatic anxiety levels and frequency both
increased during the pre-competition period whereas self-confidence intensity and frequency remained stable.

These studies demonstrate, therefore, the value of assessing the frequency of cognitive intrusions and not solely intensity levels of anxiety. From a practical viewpoint sport psychologists should be aware that although the intensity of anxiety may be reported at similar levels in the pre-competition period the frequency with which the anxiety symptoms are experienced may differ significantly. Therefore, a cognitive state where worries are experienced only 5% of the time abut the upcoming competition is very different to a state in which the worries are being experienced 60% of the time (Jones, 1995b). Furthermore, future research questions may examine the mediating effects of certain individual difference variables, such as trait anxiety (cf. Borkovec, Robinson, Pruzinsky & DePree, 1983), competition importance and degree of physical threat on the frequency dimension (Jones, 1995a).

2.5522 Facilitative and Debilitative Anxiety States

For the most part anxiety has generally been viewed as negative or debilitating towards performance, particularly in the North American sport psychology research literature. Sarason (1978) in test anxiety research stated that anxiety was viewed as a broad continuum of states ranging from "virtual immobilisation in face of potential criticism to exhilaration at the prospect of receiving accolades" (Sarason, 1978; p.193). Jones (1995a) explained how researchers have traditionally labelled the entire range of emotions associated with evaluation as 'anxiety' and consequently have failed to distinguish between facilitative and debilitative states, assuming anxiety is negative. This view of anxiety is, however, different to anxiety research in other areas of psychology, particularly test anxiety, which has established a small amount of evidence to the contrary, that anxiety can have positive performance consequences.

2.5522 Test Anxiety Literature

The notion of debilitating and facilitating dimensions of the anxiety response has been prominent in the test anxiety literature for a number of years. Alpert and Haber distinguished between debilitating and facilitating anxiety as long ago as 1960, and developed a scale (Anxiety Achievement Test; AAT) which measured not only the presence or absence of anxiety, but also whether the anxiety was interpreted as positive or negative by the individual. For example, one item on the questionnaire required a response to the question 'Nervousness while taking a test helps me to do better' and provided an example of a facilitating scale. Conversely, 'Nervousness while taking an exam or test hinders me from doing well' represented an example of one of the
debilitating items. Interestingly, results of the AAT provided significantly stronger predictions of academic performance than a conventional scale measuring only debilitating anxiety. Subsequent investigations employing the AAT have also demonstrated the value of distinguishing between debilitating and facilitating anxiety (e.g. Carrier, Higson, Klimoski & Peterson, 1984; Couch, Garber & Turner, 1983; Gaeddert & Dolphin, 1981).

Wine (1980) investigated high and low test-anxious individuals and proposed a bidirectional model of anxiety which further supported the notion of positive and negative dimensions. Specifically, Wine (1980) established that low test-anxious individuals thought about the demands of examination and what they can do to meet those demands, and hence thoughts were problem-solving in nature. Conversely high test-anxious individuals become negatively self-preoccupied prior to an exam and become absorbed in social evaluation cues. Wine (1980), therefore, believed that individuals with low test anxiety are less likely to interpret examination situations as evaluative than highly test-anxious individuals, but when they did they were more likely to see this evaluation as positive rather than negative. Thus, the stress of the examination only takes on a positive or negative interpretation following the cognitive appraisal of the situation, and even when anxiety is the result of negative self-evaluation the result is not necessarily debilitative; that is, the individual sets about the anxiety from a problem-solving perspective. Supporting these basic contentions, Geen (1980) advocated that examination situations producing high levels of arousal will result in different interpretations in individuals high or low in test anxiety.

Whilst the work within the test anxiety context has provided the basis for important developments in anxiety research, its application to other areas, such as competitive anxiety in sport may be limited. Firstly, it has examined the bidirectional model in the context of cognitive (i.e. academic) performance so that there is a need for investigation in the area of motor performance. Secondly, the research on debilitating and facilitating anxiety has largely examined anxiety adopting a unidimensional perspective. Also, little research in the test anxiety literature has examined how individual difference variables may mediate individuals' interpretations of their anxiety states. However, these research findings provided strong support for examining the positive effects of anxiety and provided the stimulus for research in the area of competitive sports.

2.55222 Sport Anxiety Literature

The sport psychology literature is characterised by a relatively scant amount of research which suggests that elevated anxiety levels can be perceived as positive towards performance. Mahoney and Avener (1977), investigating the differences between
qualifiers and non-qualifiers for the 1976 American gymnastics team, established that the qualifiers perceived their anxiety at positive and used it as a stimulant for their upcoming performance. Furthermore, Gould et al. (1983a) found that the anxiety reported by a number of elite high school wrestlers was interpreted as beneficial towards their upcoming performance.

More recently a number of other research avenues in sport psychology have suggested that anxiety is not necessarily debilitating. For example, reversal theory (Apter, 1982; Kerr, 1990) predicted that different athletes can interpret the same level of physiological arousal as either positive (excitement) or negative (anxiety) depending on which metamotivational state (telic or paratelic) the performer is operating in. Furthermore, performers can operate a psychological reversal from one state to another state and hence alter their interpretation of their arousal level. Also, catastrophe models suggest that performers may actually use elevated levels of cognitive anxiety to enhance performance provided they can control the level of physiological arousal associated with it (Hardy, 1990). Recent empirical studies have additionally demonstrated that cognitive anxiety (Parfitt & Hardy, 1987) and somatic anxiety (Jones & Cale 1989a) are not necessarily debilitating towards performance and can facilitate it.

As a result of the anxiety research in educational psychology, and the early findings from Mahoney and Avener (1977), Jones (1991, 1995a, 1995b) introduced the notion of 'direction' into the sport psychology literature. Jones (1991), and other researchers (Burton, 1990; Parfitt et al. 1990) recognised that regardless of the growing popularity of the CSAI-2 in research, the questionnaire essentially only measures the 'intensity' of the anxiety symptoms which are reported to signify the presence of anxiety. Jones (1991) stated "it is important to recognise that the CSAI-2, like many other state anxiety measures, is based on a somewhat limited dimension of the anxiety response" (p.153). However, the CSAI-2 does not, measure the 'directional perceptions' of these anxiety symptoms; that is, how the athlete perceives and interprets the symptoms of anxiety as positive and facilitative or negative and debilitative to the upcoming performance. Jones (1995a) recently explained that:

"One performer might be concerned about an upcoming event, to the extent that s/he is worried and in a near panic state. Another performer who is also 'very concerned' might view such a state as very necessary since it signals the importance of the event and means that she or he will invest effort in it (cf. Eysenck, 1984), thus constituting a motivated, facilitative state" (p.463).

Therefore, two performers with identical intensities of physical or mental symptoms might label their states completely differently on a facilitative-debilitative
continuum. The importance of cognitive appraisal in the stress/anxiety process was alluded to previously when clarifying conceptual issues in this research area (sections 2.22 and 2.23). Furthermore, the interpretation of anxiety states may be viewed as a further level of cognitive appraisal in interpreting the meaningfulness of anxiety symptoms following the earlier cognitive appraisal in the stress process (Jones, 1995a).

In order to empirically test the predictions that anxiety can have positive consequences, Jones and Swain (1992) developed the 'direction' scale which was designed to be used in conjunction with the intensity scale of the CSAI-2. Support for the direction distinction has been provided in a number of empirical studies. Jones, Swain and Hardy (1993) examined 49 gymnasts who completed the modified CSAI-2 ten minutes prior to a beam competition. The sample consisted of 14-16 year old female gymnasts who were divided into good and poor performance groups. Results indicated that the good performance group perceived their cognitive anxiety as more facilitative to performance than the poor performance group.

Further support for the directional dimension of competitive anxiety was uncovered by Jones and Swain (1992) in an examination of 69 subjects from a mixed sports sample who were divided into high and low competitive groups based on responses on the Sport Orientation Questionnaire (Gill and Deeter, 1988). No significant differences were evident regarding the intensity scales; however, the highly competitive group reported their anxiety as more facilitative and less debilitative than the low competitive group. In another study, Swain (1992) investigated intensity and direction dimensions in a longitudinal study of collegiate basketball players. Results revealed that although similar intensities of symptoms were reported, individuals varied in their interpretations of these symptoms in terms of consequences for performance.

The most recent study investigating directional perceptions by Swain and Jones (1996), who compared the relative contributions of the intensity and direction dimensions of cognitive and somatic anxiety to the prediction of basketball performance. The study involved a longitudinal design that allowed for within-subject comparisons in ten male collegiate basketball players. Results revealed that direction was a better predictor of performance than intensity for both cognitive and somatic anxiety. Although the amount of variance in performance prediction was only 25% at the most in the case of cognitive anxiety direction, the findings provide additional support for the separate assessment of the direction dimension.

2.8 The direction scale will be discussed in more detail in Chapter 3 (Study 1; section 3.421).

2.9 As this study incorporates the variable of skill level, it will be discussed in more detail in Chapter 3 (Study 1; section 3.223).
It is interesting to also recognise the lack of research that had investigated the direction perceptions of self-confidence. High levels of this key construct are repeatedly reported as being a prerequisite for peak performance (Gould, Weiss & Weinberg, 1981; Jones, Swain and Hardy (1993); Mahoney & Avener, 1977; Mahoney, Gabriel & Perkins, 1987). This is primarily in view of the fact that studies that have examined the direction of self-confidence (e.g. Jones et al., 1993) have established high correlations between self-confidence intensity and direction and therefore concluded that the scales essentially examine the same psychological state.

All the studies reviewed therefore supported the proposal that analysing athletes' perceptions of anxiety may provide better predictors of performance than the intensity of the symptoms and provide further understanding of the competitive state anxiety response. Consequently, distinguishing between positive and negative states may offer interesting avenues for future competitive anxiety research.

2.6 SUMMARY

This chapter has attempted to clarify conceptual issues in anxiety literature and to trace the principal developments in competitive anxiety research. Researchers in sport psychology initially borrowed heavily upon bodies of literature from educational and clinical psychology to generate the theoretical underpinnings for early research. However, as is evident from the previous discussion, sport-specific anxiety theories eventually developed in their own right. In summary, the concept of anxiety has been refined from drawing upon arousal-based approaches to explain the relationship between anxiety and performance, to unidimensional anxiety approaches which proposed a general anxiety system, to the most recent multidimensional conceptualisation which recognises the separate cognitive and somatic components of the anxiety response. Multidimensional anxiety research areas have been discussed in detail including: antecedents; temporal patterning; anxiety during performance; the anxiety-performance relationship; and, individual difference variables. This review has also highlighted the limitations to the traditional 'intensity alone' approach which has tended to dominate the multidimensional literature in recent years and argued for the examination of the frequency of cognitive intrusions and the examination of facilitated and debilitated anxiety states.
CHAPTER III

STUDY 1

INTENSITY AND INTERPRETATION OF ANXIETY SYMPTOMS IN ELITE AND NON-ELITE SPORTS PERFORMERS

3.1 INTRODUCTION

The previous literature review chapter discussed extensively the importance and requirement to identify the additional dimensions to the competitive state anxiety response. Specifically, the Competitive State Anxiety Inventory-2 (CSAI-2), which has predominated anxiety research in recent years, is based on a limited dimension of the anxiety response (Jones, 1991). Researchers and sport psychologists such as Burton (1990), Jones (1991) and Parfitt et al. (1990) suggested that other dimensions to the state anxiety response require attention in addition to the 'intensity' (i.e. the level or amount of anxiety) dimension which state anxiety questionnaires traditionally measure. Specifically, the examination of 'frequency' (how often the performer experiences anxiety symptoms) and 'direction' dimensions warrant research attention. The direction dimension, recently introduced into competitive anxiety (Jones, 1991, 1995b), refers to the degree to which the experienced intensity of each anxiety symptom is interpreted by the performer as either facilitative (positive) or debilitative (negative) to the subsequent performance, and is the dimension that is investigated in detail in Study 1. Previous research which has examined debilitative and facilitative dimensions of anxiety has tended to adopt a unidimensional anxiety framework investigating relationships with academic (cognitive) performance. Therefore, the major purpose of the study reported in this chapter is to employ a multidimensional anxiety framework and to examine intensity and direction of anxiety symptoms in the context of sports (motor) performance. The individual difference variable of skill level is investigated as a mediator of these responses. Elite and non-elite competitive swimmers completed a modified version of the CSAI-2 which assessed both intensity and direction...
dimensions of the state anxiety response during the period preceding an important race.

The chapter is reported in the following way. Directional perceptions have been extensively reviewed and discussed in the previous literature chapter, and therefore the specific review of research literature for this study focuses on the variable of skill level as a mediator of competitive anxiety symptoms. Specifically, the review is made up of two principal sections: The first concentrates on the differences in anxiety intensity levels between athletes of different skill levels and examines studies reporting differences in anxiety levels as a function of proximity to competition (temporal patterning studies) from a physiological arousal and unidimensional anxiety perspective. Research examining skill level differences and anxiety levels is then discussed from a multidimensional perspective. Following the examination of anxiety intensity levels, the second primary section of the review focuses on the interpretation of anxiety symptoms as a function of differences in skill level. Within this section some initial research findings are discussed regarding the psychological characteristics of elite athletic performers. This is followed by specifically reviewing the studies that have addressed the interpretation of anxiety symptoms from a unidimensional and multidimensional framework.

The review is followed by the purpose of the study and the hypotheses that have been formulated. A detailed explanation of the methodology employed in the study is then reported including the subject selection criteria and classification, the instrumentation used and the procedures that were followed. The results section then presents the data analysed using a variety of statistical techniques, and the chapter concludes with a discussion of the results from conceptual, and applied perspectives.

3.2 REVIEW OF RELEVANT LITERATURE

3.21 DIFFERENCES IN ANXIETY INTENSITY LEVELS AS A FUNCTION OF SKILL LEVEL

A considerable amount of sport psychology research has been directed towards the examination of the psychological attributes of athletes with differing skill level characteristics and particularly concerning the differences in anxiety intensity levels. The examination of these performers has been from a number of varied and inconsistent skill classifications comparing one group of athletes who are either higher in skill level or who outperform other athletes at the actual competition venue. For example, cross sectional studies have investigated qualifiers versus non-qualifiers (Highlen & Bennett 1979; Mahoney & Avener, 1977), good versus poor performance groups (Gould et al., 1981), elite or experienced versus less-elite or less-experienced performers (Fenz & Jones, 1972) and successful versus less successful (Gould et al., 1983a). All of these different group
classifications have been used as the independent variables in the research. Following the trend in anxiety research in other academic areas, the studies traditionally adopted a unidimensional perspective progressing towards a multidimensional utilisation of anxiety.

3.211 Temporal Patterning Literature 3.1

3.2111 Physiological Arousal Studies

A vast majority of the early research addressing skill level differences examined the temporal patterning of the competitive state anxiety response. This research emanated from studies carried out primarily by Fenz and associates examining physiological arousal response patterns in performers of differing skill levels (Epstein & Fenz, 1965; Fenz, 1975; Fenz & Epstein, 1967; Fenz & Jones, 1972, 1974).

Fenz and Jones (1972) assessed respiration rates and heart rates via polygraph measurements of expert (n=16) and novice (i.e. only one prior jump) sport parachute jumpers (n=14). The study adopted a temporal design initiating from when the performers arrived at the airport to the time of the parachute jump (measures were recorded at seven different points in time). Figure 3.1 shows that the two sets of jumpers indicated similar patterns of increases in physiological responses until the engine started to warm-up. Interestingly, thereafter, heart rate continued to increase in the novice jumpers; however, in contrast, the expert jumpers experienced a levelling off of heart rate followed by a decrease immediately prior to jumping.

Fenz (1975) investigated respiration, heart rate and subjective assessment to measure anxiety in another study of parachute jumpers differing in skill level. Results were similar to the previous studies by Fenz and Jones in that the poor performers (novice jumpers) showed a sharp increase in physiological activity and reported an increase in anxiety and fear up to the time of performance (i.e. the jump). Good performers (expert jumpers), however, after a sharp initial increase, showed a decrease prior to performing to a level only marginally above normal.

Taken collectively, these early studies investigating physiological arousal provided a valuable insight into the important role that skill level and experience play as an individual difference variable. It is important to highlight that terms such as arousal and anxiety have been used interchangeably by researchers in the past. Although this was discussed in the previous chapter (section 2.2), it is necessary to reiterate that in the context of these studies, that physiological arousal does not necessarily signify the presence of anxiety.

3.1 The examination of the temporal characteristics of anxiety were reviewed in the previous chapter from a multidimensional perspective primarily using the CSAI-2. Consequently, the following review section concentrates on temporal patterning in performers of differing skill levels.
3.2.11.2 Unidimensional Anxiety Studies

Mahoney and Avener (1977), decided not to assess physiological arousal levels, but to assess a unidimensional measure of anxiety via a specifically constructed self-report questionnaire adopting an 11 point Likert scale. Their results provided support for the previous findings of Fenz and Jones (1972). Specifically, at the venue for the trials of the 1976 Olympic Gymnastics Team, gymnasts who qualified for the team were compared with those who qualified for the Olympic trials but failed to make the team. The measures were taken at seven different points in time from one week prior to the competition, then immediately before and during performance from a retrospective viewpoint following
performance. The results consistently showed that the qualifiers' anxiety levels were more elevated prior to competition than the non-qualifiers, but once performance commenced anxiety levels dropped significantly to much lower levels than the performers who failed to qualify for team selection.

Researching the Canadian National Wrestling Team, Highlen and Bennett (1979) continued with a similar line of investigation which yielded a similar pattern of results. Specifically, the research team compared qualifiers versus non-qualifiers for selected wrestling tournaments on anxiety via an adapted version of Mahoney & Avener's (1977) questionnaire ('The Wrestling Questionnaire'). Findings maintained that the more successful qualifying wrestlers reported consistently lower levels of anxiety during the competition despite both groups reporting similar levels prior to the competitive match.

Furthermore, Gould et al. (1981) compared the anxiety levels of placers (i.e. top three) versus non-placers (i.e. failing to place in the top three positions) in a high standard wrestling tournament. The 'Psychological Preparation In Wrestling Questionnaire' was adopted in the study to measure anxiety (adapted from the previous studies questionnaire by Highlen and Bennett, 1979) which required the wrestlers to 'typically rate their anxiety' at different points in time. Confounding the findings of previous studies, very few differences in anxiety levels were evident between the two different groups. The results were in fact similar for both groups, in that anxiety increased prior to competition and then decreased once competition commenced. This replicated the results of the successful or more experienced athletes in the previous studies but failed to support the findings with the less experienced or unsuccessful performers. Possibly, the classification of the skill level groups was not sensitive enough to result in anxiety differences, in that, performance may have been poor on the day, but overall skill level and responses to anxiety would have been stable. Also the difference between, for example, third and fourth place in the tournament may have been extremely small, but on the basis of this classification the individuals would have been placed in different skill level groups.

Following this study, Gould et al. (1983a) examined state and trait anxiety in junior elite wrestlers using a similar questionnaire format (11 point Likert scale) to previous studies. Again, no differences in anxiety level patterns were reported between successful (i.e. winning) and less successful (i.e. losing) wrestlers.

However, other studies investigating different sport types, did once again provide support for previous research and established differences in anxiety levels as a function of proximity to competition (Gal-or, Tenebaum & Shimrony, 1986; Highlen & Bennett, 1983; Meyers, Cooke, Cullen & Liles, 1979). Specifically, Highlen and Bennett (1983) compared qualifiers with non-qualifiers for the Pan American Diving Team and found the qualifiers to be higher on self-confidence and lower on anxiety levels. These findings were
replicated by Meyers et al. (1979) examining successful versus less successful Memphis State University Racquetball Team players. Furthermore, Gal-or et al. (1986) examined 59 orienteers at the 1983 World Championships and divided the athletes into three different skill level groups based on their national and international records. They were asked to rate their anxiety on a ten point scale from 1 ("no anxiety") to 10 ("very high anxiety") at five different temporal stages from one week prior, up to the warm-up period before competition. Supporting previous findings by Fenz and Jones (1972) and Mahoney and Avener (1977) the most skilled group reported the lowest anxiety levels immediately prior to the competition.

Therefore, the early studies were fairly consistent in their findings, in that the performers with lower degrees of skill exhibited a steady increase in anxiety levels up to and during the competitive event. In contrast, the more highly skilled performers reported a similar pattern of increases in anxiety up to the start of the competition. However, this was followed by a reduction in symptoms following the start and during the performance. The findings from Gould et al. (1981, 1983a), however, failed to support the patterning of anxiety levels in performers of differing skill levels.

A number of reasons can be suggested for these equivocal findings. Firstly, the lack of consistency and variety of the independent variables (successful versus less successful, placers versus non-placers etc.) in the studies may possibly be a factor. Specifically, studies which examined changes in anxiety levels as a function of differences in skill were inconsistent in their classifications of performers. Furthermore, in the studies investigating successful versus less successful performers, it is important to recognise that despite some of the sample being unsuccessful on that one particular competitive occasion, the differences in overall skill level may have been small. The differences in ability between the groups, therefore, may not have been sensitive enough to detect differences in the dependent variable of state anxiety. Indeed, differences in skill level may even have been non-existent in the performers examined in the studies. Thirdly, Gould et al.'s studies asked the performers to 'typically rate their anxiety' prior to and during competition. Studies using this design therefore required retrospective response ratings of how the performers generally felt during the competition. Assessing anxiety levels retrospectively is inherently problematic, and therefore, measuring anxiety via this method may have resulted in less accurate findings than measuring anxiety at the time it occurred (Jones, 1991). Finally, the research would have benefited from the adoption of a multidimensional approach which recognises the different cognitive and somatic components to the state anxiety response.
3.212 Multidimensional Anxiety Perspective

Martens et al. (1990), in the extensive work carried out on the construct validation of the CSAI-2, investigated how a number of individual difference variables, including skill level, may mediate the different components of the competitive state anxiety response. Based on previous research, Martens et al. (1990) stated that more skilled athletes possess better coping skills to deal with anxiety than less skilled athletes. Consequently, Martens et al. (1990) hypothesised that highly skilled performers will show less cognitive anxiety and somatic anxiety and greater self-confidence than less skilled athletes.

A sample of 271 performers (mean age 16.94 years) were dichotomised into highly skilled and lower skilled and compared on pre-competition levels of cognitive anxiety, somatic anxiety and self confidence one hour before an important competitive event. Highly skilled athletes (n=167) were classified as those individuals who participated in the 1982 National Sports Festival (for prospective Olympic performers). Lower skilled performers (n=104) were high school athletes. The sample was drawn from a variety of different sports and included both males and females. A multivariate analysis of variance (MANOVA) revealed highly significant differences between the two groups (F (3, 267) = 6.05; p< .001). Follow-up univariate analysis of variance as summarised in Table 3.1 indicated that the high skilled group was significantly lower on cognitive anxiety and somatic anxiety, but significantly higher on self-confidence.

<table>
<thead>
<tr>
<th>Table 3.1</th>
<th>Means and F Ratios for One-Way Analyses of Variance on CSAI-2 Subscales (Martens et al. 1990)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High Skill [mean]</td>
</tr>
<tr>
<td>Cognitive Anxiety</td>
<td>17.23</td>
</tr>
<tr>
<td>Somatic Anxiety</td>
<td>15.38</td>
</tr>
<tr>
<td>Self-Confidence</td>
<td>23.80</td>
</tr>
</tbody>
</table>

Although these results support Martens et al.'s (1990) hypotheses, a degree of caution is advisable. Specifically, the sample was drawn from a wide variety of sports including individual and team sports and objective and subjective sports which may confound the results. Additionally, although the mean ages of the sample were similar, the
maturational differences in the sample as highlighted by Martens et al. (1990) need to be taken into account. No explanation for why this should affect the results is forwarded by the author, but differences in maturity may have caused distortion of the responses due to misinterpretation in the subjects lower in maturity. However, these initial findings are interesting and provide a basis for the generation of future research in the area.

3.22 INTERPRETATION (i.e. DIRECTION) OF ANXIETY SYMPTOMS AS A FUNCTION OF SKILL LEVEL

An extensive discussion of the 'direction' literature from both a general psychology and sport psychology perspective has been presented in the previous chapter. Only a scant amount of research attention, however, has been directed towards the interpretation of anxiety symptoms in performers of differing skill level, from either a unidimensional or multidimensional perspective. This is surprising in view of the fact that over thirty years have passed since the positive properties of anxiety were uncovered in non-sporting environments with Alpert & Haber's (1960) findings in the test anxiety literature. Therefore, for a considerable period of time a number of researchers have questioned the traditional view of anxiety as being negative and detrimental towards performance. Initial studies that have established findings relating to interpretations of anxiety adopted both questionnaire and interview techniques; however, these early studies did not directly address directional perceptions. A small amount of research evidence is available from a unidimensional and multidimensional perspective that does directly address this issue.

3.221 Psychological and Anxiety Characteristics of Elite Performers: Some Initial Research Findings

It is important to highlight that the following studies report some initial findings from the psychological examination of elite athletic performers. In these studies 'direction' or the interpretations of anxiety symptoms as positive or negative, per se, is not directly investigated. However, under close examination a number of tentative findings pertaining to facilitative/debilitative interpretations are uncovered.

Mahoney, Gabriel and Perkins (1987) investigated psychological skills in a sample of 713 subjects of varying skill levels from 23 different sports. Specifically, the subjects comprised elite (n=126), pre-elite (n=141) and non-elite (n=446) athletes. The sample completed a 51 item 'Psychological Skills Inventory for Sports' (PSIS) which was designed to investigate concentration, self-confidence, mental preparation, team emphasis and anxiety measurement.

Results revealed interesting findings between the different skill level groups, but regarding anxiety, the elite athletes experienced fewer problems with anxiety than their less
skilled counterparts. Specifically, they reported being more efficient at controlling tension levels, worried less about choking during an important competition and were less panic-stricken prior to performance. Also, supporting previous studies from the temporal patterning literature, the elite athletes experienced greater self-confidence levels that tended to remain more stable than the non-elite athletes.

Although no direct item on the questionnaire enquired about the interpretation of anxiety symptoms, item 15 required a response to the question: "I tend to perform better when I feel more tense rather than less tense". This therefore indicated that the positive impact of anxiety increases with an increase in 'intensity' levels, and uncovers a tenuous link with directional perceptions of anxiety symptoms. Interestingly, a significant difference emerged between the elite and pre-elite groups with 52.4% of the elite groups agreeing with this statement as compared to 34.3% of the pre-elite and only 44.8% of the non-elite. Although this is an interesting finding, its link with directional perceptions is not particularly strong. Specifically, limitations to the response scale of the PSIS need to be recognised in addition to the unidimensional conceptualisation of anxiety which relates more to the somatic component. No item on the questionnaire follows this line of questioning relating to cognitive anxiety. The response scale of the questionnaire was constrained by a dichotomous true/false format and not a Likert type format. The study was also limited by the fact that there were significant age differences across the three skill level samples and an uneven representation of performers of various skill levels across the 23 sporting disciplines.

Gould, Ecklund and Jackson (1992a) using qualitative methods of enquiry and inductively analysing the members (n=20) of the USA Olympic wrestling team found that prior to their best match a general dimension emerged from the data called 'Optimal Prematch Mental State Descriptors'. The sub-themes of this dimension included positive expectancies, heightened effort, commitment, and interestingly, heightened arousal intensity. Observing the raw data quotations that are evident within this higher order theme (i.e. heightened arousal intensity), the quotes related to a positive interpretation of the pre-competition symptoms that were experienced. For example, some wrestlers reported they "felt nervous but not pressured" and "felt nervous and confident". These were in contrast to the negative feeling states associated with the worst match mental state descriptors. Furthermore, when observing the subgroup comparisons of medal winners at the Olympics against the wrestlers who did not place in the top three, denoting athletes of different skill levels, additional meaningful findings emerged. Specifically, 100% of the medal winners referred to optimal mental state descriptors pertaining to facilitative interpretations, against 86% in the case of the wrestlers who failed to gain a medal position. Also, 100% of the medal winners reported heightened arousal/intensity against only 57% of the non-medal
winners. Interestingly, a similar pattern of results emerged in the second article in the series (Gould et al., 1992b) which examined thoughts and affect during the performances of these matches. Specifically, during best matches wrestlers were optimally aroused, but had inappropriate feeling states during their worst matches.

Furthermore, Jackson (1992) examined flow experiences (Csikszentmihalyi, 1990; Csikszentmihalyi & Csikszentmihalyi, 1988) by interviewing sixteen championship figure skaters. Results revealed that, among the factors perceived as most important for getting into a flow state included a positive mental attitude including high confidence and positive thoughts. Furthermore, a dimension labelled 'Positive Pre-Competitive and Competitive Affect' emerged from the data. Within this dimension, the skaters expressed that controlling nervousness and turning it into energy, and importantly in the context of this study, "having good stress" were important factors for generating a flow state.

Since these studies do not directly measure directional perceptions of anxiety symptoms, a note of caution is recommended in the interpretation and suggestions from the findings. However, taken collectively, these studies suggest that elite and very highly skilled athletes do possess the ability to positively interpret their pre-competition symptoms of anxiety.

3.222 Interpretation (i.e. Direction) of Anxiety Symptoms:
A Unidimensional Perspective

Mahoney and Avener (1977) were the first researchers working in the area of sport psychology to challenge the traditional notion of anxiety as negative and detrimental towards performance. These authors investigated psychological factors and cognitive strategies by examining a sample of gymnasts attempting to qualify for the United States Gymnastics Team for the 1976 Olympic Games, and compared those gymnasts who qualified for the Olympic team with those who failed to qualify for the team but did compete at the trials.

Data from qualitative interviews which were carried out to complement and extend understanding of the questionnaire data suggested that the successful performers used the anxiety they experienced as a stimulant for their upcoming performance. Conversely, the non-qualifiers appeared to arouse themselves into near panic states by self-doubting verbalisations and images of impending failure and tragedy. The more highly skilled qualifying performers, therefore, experienced a facilitative interpretation of their symptoms as opposed to those who failed to qualify experiencing debilitating interpretations.

3.2 For details on the instrumentation and temporal patterning findings from this study refer to Chapter 3 (Study 1; section 3.2112).
Mahoney and Avener (1977) specifically commented:

"The more successful athletes tended to 'use' their anxiety as a stimulant to better performance. The less successful gymnasts seemed to arouse themselves into near panic states by self-verbalisations and images that belied self-doubts and impending tragedies" (p. 140).

This study was the first to uncover directly that differences in the way performers interpret their anxiety symptoms may be evident between performers of differing levels of skill. Despite a unidimensional perspective on the anxiety response, a small study sample and a relatively weak design, this study provided a rationale and major stimulus for research in the area for directional perceptions.

3.223 Interpretation (i.e. Direction) of Anxiety Symptoms:
A Multidimensional Perspective

The only study that has examined the directional interpretations of multidimensional state anxiety in performers of varying skill levels is that of Jones et al. (1993). These authors examined the relationship between intensity and direction dimensions of state anxiety and good and poor performances in 48 female gymnasts competing in a beam competition. The subjects completed a modified version of the CSAI-2 ten minutes prior to performance. This questionnaire required the gymnasts to rate the degree to which the intensity of each symptom (cognitive and somatic) was perceived as either facilitative or debilitative to performance on a scale from -3 ("very debilitating") to +3 ("very facilitative"). A median split technique was utilised to divide the subjects into two groups of 24 subjects on their performance which was based on videotaped analysis of the beam performances by qualified judges. This technique used to dichotomise the subjects into good and poor performance groups was successful with a significant difference of \( p < 0.001 \) being reported between the two groups on their performance scores. Results revealed no differences between the two groups on the intensity of their pre-competition symptoms. However, the good performance group reported their cognitive anxiety as more facilitative (\( M = +9.25 \)) than the poor performance group (\( M = +4.5 \)). There were no significant differences between the groups on the direction dimension of somatic anxiety or the intensity of self confidence. However, it is worth noting that the difference between the two groups on somatic anxiety direction did approach significance with a \( p \) value of 0.08 (good performance mean value = +5.50; poor performance mean value = +0.63). This study generated interesting questions regarding the interpretation of anxiety symptoms in performers of differing skill levels and acted as a major stimulus for the research question and hypotheses for this study.
3.3 STUDY 1: PURPOSE OF THE STUDY

The major purpose of this study was to employ a multidimensional anxiety framework and to examine intensity and direction of anxiety symptoms in the context of sports (motor) performance. The individual difference variable of skill level was investigated as a mediator of these responses. Specifically, elite and non-elite competitive swimmers were investigated during the period preceding an important competitive race.

A further purpose of this study was exploratory in nature since it sought to examine the intensity of the responses as a function of whether subjects reported their cognitive and physiological symptoms as debilitative or facilitative. Particular interest was focused upon the level of self-confidence in debilitated and facilitated individuals since it has been proposed that the direction of the anxiety response may mediate confidence levels (cf. Bandura, 1977; Jones et al., 1993). This proposal was examined in this study as a function of skill level.

3.3.1 HYPOTHESES

Due to the exploratory nature of this study and lack of theoretical rationale on which to base specific hypotheses, only tentative predictions were formulated. Therefore, in accordance with the scant amount of previous research (Jones et al., 1993; Mahoney & Avener, 1977) it was expected that:

(1) No differences would be evident in intensity levels of the two skill level groups;

(2) The elite performers would report more facilitative interpretations of their pre-competition anxiety symptoms than the non-elite performers;

(3) Self-confidence would be higher in the elite subjects.

Also, due to a lack of previous research findings on which to draw, no hypotheses were formulated for the study regarding the examination of the intensity of the responses in the skill level groups as a function of interpretation of cognitive and physiological symptoms as facilitative or debilitative.

3.4 METHOD

3.4.1 SUBJECTS

The subjects comprised 211 competitive swimmers ranging in age from 14 to 29 years, with a mean age of 18.98 years (SD=2.58). Of the 211 subjects, 112 were male.
(M=19.74, SD=2.86), and 99 were female (M=18.11, SD=2.60). In order to obtain an adequate sample size it was necessary to draw the sample from seven different swim meets during 1992 and the early part of 1993. The majority of the subjects were examined at two competitions, the British Universities Sports Federation Open National Championships in Barnet Copthall (London) (n=78), and the British Olympic swimming trials in Sheffield (n=75). The additional competitions included an International meet in France (n=15), District and National League competitions (n=25), County (n=12) and Club Championships (n=6).

3.411 Skill Level Classification (Elite Versus Non-Elite Performers)

Elite and non-elite swimmers were distinguished on the basis of achievement or non-achievement of the qualifying time set by the Amateur Swimming Association (ASA) to compete in the Olympic Swimming Trials or Senior National Long Course Championships. Non-elite swimmers were, therefore, those performers who failed to qualify for these high standard competitions. It should be highlighted that these qualifying standard times require the swimmers to produce very high levels of performance. The qualifying criteria are extremely stringent and a relatively small number of individuals do achieve qualification for their respective events each year. Furthermore, these target times are the highest standards of any qualifying times designated for National events by the ASA in Great Britain.

Following this procedure, 97 elite swimmers emerged, ranging in age from 14 to 29 years, with a mean age of 19.46 years (SD=3.12). Of the 97 subjects 52 were male (M=20.48, SD=2.95), and 45 were female (M=18.29, SD=2.91).

The non-elite subjects comprised 114 competitive swimmers ranging in age from 14 to 27 years, with a mean age of 18.56 years (SD=2.55). Of the 114 subjects, 60 were male (M=19.1, SD=2.63) and 54 were female (M=17.96, SD=2.34).

3.42 INSTRUMENTATION

3.421 Modified Version of the CSAI-2

The CSAI-2 was used to measure pre-performance cognitive anxiety, somatic anxiety and self-confidence. The scale comprises the original 27 items, with nine items in each subscale. Examples of cognitive anxiety items include "I am concerned about this competition" and "I am concerned about performing poorly", whilst somatic anxiety items included "I feel nervous" and "my body feels tense". Self-confidence items included "I feel at ease" and "I'm confident about performing well". The response scale asked each subject to rate the intensity with which each symptom was being experienced on a scale from 1...
("not at all") to 4 ("very much so"). Thus, possible intensity scores on each subscale ranged from 9 to 36.

In addition, a direction scale developed by Jones and Swain (1992) was included for the cognitive and somatic anxiety items in which each subject rated the degree to which the experienced intensity of each symptom was either facilitative or debilitative to subsequent performance on a scale from -3 ("very debilitative") to +3 ("very facilitative"). Therefore, possible direction scores on each subscale ranged from -27 to +27 (see Appendix 1).

The format of the questionnaire was such that for each item participants first indicated the intensity of the thought/feeling. They then indicated the extent to which the intensity was either debilitative or facilitative before moving on to the next item. The instructions accompanying the direction response scale were as follows:

"When you have this thought/feeling do you normally regard it as negative (debilitative) or positive (facilitative) in relation to your upcoming performance. NB if you score 1 ("not at all") on the first scale, then respond in relation to that thought/feeling e.g. if your response is "not at all" to question 4, then respond as if you had no self-doubts."

Impressive psychometric properties have been reported for the CSAI-2 during its construct validation. Martens et al. (1990) has demonstrated that the questionnaire has good internal consistency with Cronbach's Alpha coefficients ranging from 0.79 to 0.90 indicating that items in the three separate subscales are sufficiently homogenous. Concurrent validity of the inventory has also been supported with a variety of previously validated trait scales such as the 'Sport Competition Anxiety Test' (Martens, 1977) and state scales including the 'Cognitive-Somatic Anxiety Questionnaire' (Schwartz et al., 1978).

3.43 PROCEDURE

The modified CSAI-2 was administered approximately one hour prior to the swimmers' main and most important competitive events. This time frame was recommended by Martens et al. (1990) and employed by Jones et al. (1990) and was regarded as an acceptable time to complete the questionnaire since it did not interfere with the swimmers' warm-up routines at these important competitions. Permission was sought from and granted by the swim meet organisers to approach coaches and swimmers at the competitions.

3.3 For more detail on the development of the CSAI-2 see Chapter 2 (section 2.521)
Prior to completion of the CSAI-2, each swimmer was presented with the 'Anti-Social Desirability Instructions' and the standardised directions for completion of the questionnaire based upon the recommendations of Martens et al. (1990). The 'Anti-Social Desirability Instructions' were communicated orally and written in full preceding the items of the questionnaire and are as follows:

"The effects of highly competitive sports can be powerful and very different among athletes. The inventory you are about to complete measures how you feel right now about competition. Please complete the inventory as honestly as you can. Sometimes athletes feel that they should not admit to any nervousness, anxiety or worry they experience before competition because this is undesirable. Actually, these feelings are quite common, and to help me understand them I want you to share your feelings with me openly. If you worry about competition or have butterflies or other feelings that you know are signs of anxiety, please indicate these feelings accurately on the inventory. Equally, if you feel calm and relaxed, indicate those feelings as accurately as you can. Your answers will not be shared with anyone. I will be looking only at group responses. Please remember that you are responding to how you feel right now about competition."

The directions for completion emphasised the confidentiality of responses at an individual level, the need for total honesty and an indication of their thoughts and feelings "right now". The completion time for the questionnaire ranged from 5 to 10 minutes and was completed without external interference. The study researcher was present at all times to ensure that the subjects were not sampled more than once across the different swim meets.

3.44 DATA ANALYSIS

Analysis of the data was divided into a number of different stages. The first stage involved analysing the internal reliability of the cognitive and somatic anxiety direction scales for this sample, the correlations among the intensity and direction subscales, and descriptive data in terms of the means and standard deviations for each of the cognitive and somatic anxiety intensity and direction scores.

Stage two involved conducting multivariate analysis of variance (MANOVA) on the skill level groups, with groups (elite versus non-elite) as the independent variable and with the modified CSAI-2 intensity and direction scores as the dependent variables. This analysis was conducted to examine if any overall differences were evident between the two groups. Stage three involved examining the specific effect differences in the modified CSAI-2 scores via follow-up univariate analyses of variance (ANOVAs). These were conducted in the cases of all significant MANOVA effects.

Stage four of the analysis involved the creation of a new independent variable...
which was derived from each subject's cognitive and somatic anxiety 'direction' scores. Specifically, subjects were dichotomised into those who had negative scores ('debilitated' group) and those who had positive scores ('facilitated' group) on both of the direction variables. Following this procedure a Chi Square analysis was carried out to investigate if the frequency of subjects in the new groups differed as a function of skill level.

The final stage of the analysis involved conducting a two-way MANOVA and follow-up ANOVAs with group (elite versus non-elite) acting as the first independent variable and the newly created direction variable (facilitated versus debilitated) acting as the other independent variable. The dependent variables were, therefore, cognitive anxiety intensity, somatic anxiety intensity and self-confidence. These analyses were carried out to examine if anxiety intensity and self-confidence differed as a function of directional perceptions and skill level.

3.5 RESULTS

3.5.1 RELIABILITY ANALYSES, CORRELATIONS AND DESCRIPTIVE DATA

Internal reliability analyses were conducted on the cognitive and somatic anxiety direction subscales since these have been reported in only one previous study examining basketball players (Swain & Jones, 1996). Split-half reliability coefficients on the current data revealed R values of 0.86 for cognitive anxiety direction and 0.83 for somatic anxiety direction. These values are acceptable, and actually higher than the R values of 0.83 and 0.72 for cognitive and somatic anxiety respectively reported by Swain and Jones (1996).

The correlation coefficient between the intensity scores for cognitive and somatic anxiety was 0.58, and of a similar magnitude to that found in previous studies (e.g. Gould et al., 1984; Martens et al., 1990). The correlations between cognitive anxiety intensity and direction and somatic anxiety intensity and direction scores were -0.20 and -0.17 respectively. These values demonstrate a maximum of only 4% common variance, and support the separate measurement of intensity and direction dimensions.

Mean scores for 'intensity' of cognitive, somatic anxiety and self-confidence were 20.23 (SD=5.31); 18.84 (SD=5.23) and 22.78 (SD=5.89) respectively. When compared to CSAI-2 norms for swimmers reported by Martens et al. (1990), the cognitive anxiety intensity score for the sample of swimmers in this study equates approximately to the 75th percentile, the somatic anxiety intensity score equates approximately to the 65th percentile, while the self-confidence score equates approximately to the 38th percentile. Mean scores for direction were 2.12 (SD=8.26) for cognitive anxiety and 3.86 (SD=7.94) for somatic anxiety.
"Multivarite" Analysis of Variance (MANOVA)

In order to establish if there was an overall significant difference between the elite and non-elite groups' scores on the subcomponents of the modified CSAI-2 a one-way MANOVA was carried out. Specifically, skill level (elite versus non-elite) acted as the independent variable, with cognitive and somatic anxiety intensity, self-confidence and cognitive and somatic anxiety direction acting as the five dependent variables. The results revealed that the MANOVA was significant, Wilks Lambda = 0.81, F (5, 205) = 9.46; p< .001.

Analysis of Variance (ANOVA)

As may be seen in Table 3.2, separate one-way analyses of variance were carried out for each of the cognitive anxiety and somatic anxiety subscale intensity and direction scores, and also for self-confidence, to examine differences between the elite and non-elite groups. The elite and non-elite swimmers did not differ significantly on either of the cognitive anxiety and somatic anxiety intensity scores. However, the elite swimmers reported significantly more facilitative interpretations of both cognitive anxiety (p<.01) and somatic anxiety (p<.001) symptoms in relation to their upcoming performance.

### Table 3.2 Means, Standard Deviations and F Ratios for One-Way Analyses of Variance on Modified CSAI-2 Subscales

<table>
<thead>
<tr>
<th></th>
<th>NON-ELITE</th>
<th>ELITE</th>
<th>df</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive Anxiety</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intensity</td>
<td>20.25 (5.33)</td>
<td>20.21 (5.23)</td>
<td>1,209</td>
<td>0.003</td>
<td>NS</td>
</tr>
<tr>
<td>Direction</td>
<td>0.47 (8.44)</td>
<td>4.07 (8.47)</td>
<td>1,209</td>
<td>9.54</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Somatic Anxiety</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intensity</td>
<td>18.79 (5.57)</td>
<td>18.91 (5.94)</td>
<td>1,209</td>
<td>0.026</td>
<td>NS</td>
</tr>
<tr>
<td>Direction</td>
<td>1.54 (7.81)</td>
<td>6.59 (7.22)</td>
<td>1,209</td>
<td>23.43</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Self-Confidence</td>
<td>20.81 (5.68)</td>
<td>25.09 (5.27)</td>
<td>1,209</td>
<td>31.87</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>
A significant difference also emerged for self-confidence ($p<.001$), with the elite swimmers reporting a higher level. The ANOVA summary tables are presented in Appendix 2.

### 3.53 INTENSITY SCORES AS A FUNCTION OF DEBILITATION /FACILITATION AND SKILL LEVEL

For the purpose of these analyses, a new independent variable was created which was derived from each subject's scores on the cognitive anxiety and somatic anxiety direction variables. To reiterate, subjects were dichotomised into those who had negative scores ('debilitated' group) and those who had positive scores ('facilitated' group) on both of the direction variables. Thus, the 'debilitated' group comprised those subjects who had negative scores on both cognitive and somatic anxiety direction, whereas the 'facilitated' group consisted of those subjects who had positive scores on both. Those subjects who had a combination of a positive score and a negative score ($n=58$) were omitted from the analyses, leaving a sub-sample of 153 (non-elite=78; elite=75).

#### 3.531 Chi Square Analysis

A 2x2 chi square analysis was carried out to investigate if the frequency of subjects in the debilitated and facilitated groups differed as a function of skill level. This revealed a significant difference ($X^2=24.48; p<.001$), with the observed frequencies in the four cells shown in Table 3.3. The data reveals the small number of elite swimmers who reported debilitative states for both cognitive and somatic anxiety, and the relatively small number of non-elite swimmers who reported facilitative states. The majority of the elite swimmers reported facilitative states, whilst the majority of the non-elite swimmers reported debilitative states. Contingency summary tables are presented in Appendix 3.

<table>
<thead>
<tr>
<th></th>
<th>Non-Elite</th>
<th>Elite</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debilitated</td>
<td>41</td>
<td>11</td>
<td>52</td>
</tr>
<tr>
<td>Facilitated</td>
<td>37</td>
<td>64</td>
<td>101</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>78</strong></td>
<td><strong>75</strong></td>
<td><strong>153</strong></td>
</tr>
</tbody>
</table>

Table 3.3 Contingency Table of Observed Frequencies of Debilitated and Facilitated Subjects as a Function of Skill Level
"Multivariate" Analysis of Variance (MANOVA)

In order to assess the separate and interactive effects of skill level and direction on the intensity subscales of the CSAI-2, a separate two-way MANOVA was conducted. Skill level (elite/non-elite) and direction (debilitators/facilitators) acted as the independent variables and the 'intensity' subscales for cognitive anxiety, somatic anxiety and self-confidence acting as the dependent variables. The results revealed a significant interaction, Wilks Lambda = 0.93, F (3, 147) = 3.77; p< .01 as well as a significant main effects for direction (facilitated/debilitated) Wilks Lambda = 0.88, F (3, 147) = 6.43; p< .001 and skill level (elite/non-elite), Wilks Lambda = 0.90, F (3, 147) = 5.43; p< .001.

Analyses of Variance (ANOVA)

Separate two-way analyses of variance (skill level x direction) were conducted on the cognitive anxiety intensity, somatic anxiety intensity and self-confidence scores. The findings for the cognitive anxiety intensity (p<.05), somatic anxiety intensity (p<.05) and self-confidence (p<.01) scores revealed significant interactions in all three cases. Means, standard deviations and F ratios for the interactions are presented in Table 3.4.

Table 3.4 Means, Standard Deviations and F Ratios for Two-Way Interactions for Cognitive Anxiety Intensity, Somatic Anxiety Intensity and Self-Confidence

<table>
<thead>
<tr>
<th></th>
<th>NON-ELITE</th>
<th>ELITE</th>
<th>df</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DEB.</td>
<td>FAC.</td>
<td>DEB.</td>
<td>FAC.</td>
<td></td>
</tr>
<tr>
<td>Cognitive Anxiety</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intensity</td>
<td>22.22</td>
<td>18.46</td>
<td>19.00</td>
<td>19.81</td>
<td>1,149</td>
</tr>
<tr>
<td></td>
<td>(5.89)</td>
<td>(3.99)</td>
<td>(5.48)</td>
<td>(5.02)</td>
<td></td>
</tr>
<tr>
<td>Somatic Anxiety</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intensity</td>
<td>21.10</td>
<td>16.84</td>
<td>17.91</td>
<td>18.63</td>
<td>1,149</td>
</tr>
<tr>
<td></td>
<td>(4.41)</td>
<td>(4.25)</td>
<td>(7.82)</td>
<td>(5.33)</td>
<td></td>
</tr>
<tr>
<td>Self-Confidence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intensity</td>
<td>17.88</td>
<td>25.00</td>
<td>24.64</td>
<td>26.03</td>
<td>1,149</td>
</tr>
<tr>
<td></td>
<td>(4.30)</td>
<td>(5.29)</td>
<td>(7.66)</td>
<td>(4.45)</td>
<td></td>
</tr>
</tbody>
</table>
Follow-up Scheffe tests were employed to determine between which means significant differences were evident. The findings revealed that in the non-elite group, the debilitated subjects were higher on cognitive and somatic anxiety and lower on self-confidence than the facilitated subjects. In the elite group, on the other hand, there were no differences between debilitated and facilitated subjects on any of the variables. ANOVA summary tables, and follow-up Scheffe tests from these analyses are presented in Appendix 4 and 5.

3.6 DISCUSSION

The findings from this investigation provide further encouraging support for the distinction between intensity and direction of competitive state anxiety symptoms. They also emphasise the importance of skill level as an individual difference variable in the examination and generation of greater understanding of the nature of the competitive anxiety response.

Differences between performers of differing skill levels have been reported previously and discussed in this chapter; however, this research has tended to examine differences in the intensity or level of the anxiety symptoms and the ability of the highly skilled performers to control the symptoms in comparison to performers with lesser degrees of skill. Mahoney and Avener's (1977) study was the first to claim that successful qualifying performers reported their anxiety as a stimulant towards performance, in stark contrast to the non-qualifiers who perceived their symptoms as extremely detrimental and negative towards competition. Moreover, interesting findings emerged from the study conducted by Jones et al. (1993) regarding good performers in gymnastics interpreting their anxiety symptoms as more facilitative than the poor performers. The present study, therefore, represents a detailed investigation of the relationship between intensity and direction dimensions of competitive state anxiety as a function of differing skill levels. Specifically, the major purpose of the study was to employ a multidimensional anxiety framework to examine these dimensions in the context of competitive swimming performance with the skill level (elite versus non-elite) of the swimmers acting as the mediator of these responses. The second purpose was exploratory, and sought to examine the intensity of cognitive anxiety, somatic anxiety and self-confidence as a function of the subjects' interpretations of their cognitive and physiological symptoms as facilitative or debilitative. This purpose was also examined as a function of skill level. To restate, the hypotheses formulated predicted that no differences between the skill level groups on the intensity of the responses would emerge, but the elite group would interpret these symptoms as more facilitative than the non-elite group. It was also hypothesised that self-confidence would be higher in the elite group. No hypotheses were formulated between the groups relative to the exploratory aspect of the study, i.e., the intensity of the responses.
as a function of the facilitation/debilitation classification.

The major hypotheses under investigation in this study were supported. Whilst the intensity of both the cognitive and somatic anxiety responses did not differ between the non-elite and elite groups, their interpretations of those responses in terms of their consequences for subsequent performance differed markedly. The elite group reported both cognitive state anxiety and somatic state anxiety responses as being more facilitative and less debilitative to their swimming performance than the non-elite group. The more positive interpretation of the pre-competition symptoms on the part of the elite swimmers is likely to be tied in closely with the fact that they reported significantly higher levels of self-confidence, therefore supporting the third study hypothesis. Interestingly, Jones et al. (1993) showed that the direction dimensions of cognitive and somatic anxiety correlated more strongly with self-confidence than did the intensity of both responses. Further support for this contention is provided in this study, in that cognitive and somatic anxiety direction resulted in higher correlations with self confidence than the intensity subscales (0.42 compared with 0.31 and 0.43 compared with 0.30). Jones et al. (1993), supporting an earlier suggestion by Hardy and Jones (1990), contended that self-confidence may in some way protect against potential debilitative anxiety effects. Indeed, it is those performers who have least confidence in their ability to control both themselves and the environment who are most likely to experience debilitative anxiety symptoms (cf. Borkovec, Metzger & Prusinski, 1986; Carver & Scheier, 1986, 1988; Eysenck, 1992).

Further insight into differences between elite and non-elite performers is provided by the exploratory aspects of this study in which subjects were divided into groups based not only on skill level but also on whether they reported both their cognitive and somatic anxiety symptoms as being facilitative or debilitative. The facilitated group included subjects who reported both cognitive and somatic anxiety interpretations as positive and vice versa for debilitative interpretations of both subscales. Chi-square analysis revealed that, of the subjects who could be classified as either debilitated or facilitated, 52.6% of the non-elite group experienced debilitative symptoms and 47.4% experienced them as facilitative. These proportions are in complete contrast to the 14.7% and 85.3% of the elite group who interpreted their symptoms as debilitative and facilitative respectively. Whether such a difference is the cause or result of achieving elite status cannot be addressed in the context of the present study, but poses an interesting question for future research. A further question worthy of examination is how elite sports performers have acquired the cognitive skills and strategies which enable them to interpret their pre-competition symptoms as facilitative. This research question is addressed extensively in Chapter 5, Study 3.

It is also interesting to note that of the 153 participants in the present study
dichotomised and classified in this way (facilitated/debilitated) 66% (n=101) reported their anxiety symptoms as facilitative to their upcoming performance. These results are particularly enlightening when one considers that the mean value for cognitive anxiety for the subjects in this study (M=19.32) was greater than the norm values reported by Martens et al. (1990) for cognitive state anxiety responses, as was also the case of somatic anxiety (M=18.0). Although it is conceivable that these interpretations may represent a form of cognitive restructuring strategy for coping, it could equally be argued that they present further problems for the assumption that anxiety is negative and detrimental to performance. This has serious implications, therefore, for employing conventional state anxiety questionnaires which may be unsuitable. For the most part, these questionnaires represent merely a measure of the intensity of certain cognitive and physiological symptoms which have been labelled as anxiety by those who have developed them. The performer's own labelling of such symptoms would appear to be considerably more pertinent in the search for understanding the anxiety response in competitive situations.

Observation of the means of the intensity of cognitive anxiety, somatic anxiety and self-confidence in the debilitated and facilitated performers within the elite and non-elite groups provides a revealing and interesting pattern of results. The findings for the non-elite group only show that the debilitated sub-group experienced greater intensity of both cognitive and somatic anxiety symptoms, whilst self-confidence was considerably lower in the debilitated performers. In the elite group, on the other hand, there were no differences on any of the three subscales, although these findings should be treated with some caution since the debilitated group comprised only eleven swimmers. What is interesting about the non-elite group is that the intensity of the cognitive and somatic responses did appear to influence the swimmers' directional interpretations of them, with higher anxiety levels being associated with more negative interpretations of their potential consequences. However, in the elite group, debilitated and facilitated subjects did not differ on intensity. It is also interesting to note that self-confidence in the elite/debilitated group was the same as that in the elite/facilitated group.

An important question for future research emanating from the findings of this study, relates to whether one can predict who will report their anxiety symptoms as debilitating or facilitative and in which situations. In addition to the distinction between elite and non-elite performers, other individual difference variables offer some interesting avenues. A variable of particular importance relates to perceptions of control. As alluded to earlier, it is hypothesised that it is those performers who have least confidence in their ability to control both themselves and the environment who will experience debilitating anxiety symptoms (cf. Borkovec et al., 1986; Carver & Scheier, 1986, 1988; Eysenck, 1992).
In summary, these findings suggest that elite performers do not differ from non-elite performers on the intensity of pre-competition anxiety symptoms, but that they do have a more positive interpretation of these symptoms in terms of their consequences for performance. They also suggest that elite performers who do experience debilitative anxiety symptoms possess an effective cognitive strategy for maintaining confidence levels. From an applied perspective, the results of this, and other previously discussed studies demonstrate that reducing the levels of pre-competition cognitive and perceived physiological symptoms via stress management strategies may be wholly inappropriate if the interpretation of these symptoms is facilitative. In the context of the performers studied in this chapter, sport psychologists should recognise that performers of different skill levels have a tendency to interpret symptoms differently and consequently psychological interventions may need to be tailored to the standard of the competitor. Specifically, if a non-elite performer interprets the symptoms as debilitative, a strategy to reduce the intensity of the symptoms may be appropriate, in that, this may permit the individual to perceive the symptoms as more suitable therefore reflecting a more appropriate state of readiness. Conversely, elite level individuals who are suffering from debilitative interpretations of their pre-competition thoughts and feelings may benefit more from a cognitive restructuring intervention (cf. Apter, 1982; Kerr, 1990) directed towards restructuring negative interpretations to more positive perceptions.
CHAPTER IV

STUDY 2

INTERPRETATION OF COMPETITIVE ANXIETY SYMPTOMS AND GOAL ATTAINMENT EXPECTATIONS

4.1 INTRODUCTION

The previous study examined the intensity and direction dimensions of competitive state anxiety as a function of skill level in a sample of elite and non-elite competitive swimmers. The results showed, that although there were no differences in the level of cognitive and somatic anxiety between the two skill level groups, the elite group reported significantly greater facilitative interpretations of these symptoms than the non-elite performers. An important question arising from these results related to perceptions of control. Specifically, it was hypothesised that it is those performers who have least confidence in their ability to control both themselves and their environment who will experience debilitative anxiety symptoms (cf. Borkovec et al., 1986; Carver & Scheier, 1986, 1988; Eysenck, 1992).

The second study continues the line of investigation into the directional interpretations of anxiety symptoms via the examination of a control model proposed by Jones (1995a). This model predicts that sports performers' interpretations of their competitive anxiety symptoms are a function of goal attainment expectancies. A high-standard sample of competitive swimmers was assessed on the intensity and direction dimensions of their cognitive anxiety and somatic anxiety responses one hour before an important race. The swimmers also responded to scales which asked about their level of expectancy about achieving outcome, performance and process goals which they had set for the race. A secondary purpose of the study was to examine the face validity of the direction scale of the modified CSAI-2 using an adjective labelling list, also completed prior to the race, which included both positive and negative emotional labels.
This chapter follows a similar overall structure to the first study, and is reported in the following way. The review of relevant literature comprises two main sections. The first concentrates on perceptions of control and explains in detail Jones' (1995a) model. The second focuses on the extensive area of goal setting. The goal setting literature is subdivided into four sections. Firstly, a brief review of the early research in the area is provided including the main principles of goal setting theory. The application of the principles from these environments are then discussed in competitive sport. The third section focuses on the relationship between goal setting and anxiety, and finally, from a more applied perspective, the different types of goals that performers set for competition is reviewed. This final sub-section reviewing goal type is then related back to Jones' (1995a) model.

The review of relevant literature is followed by the purpose of the study and general hypotheses forwarded to address the research question. The methodology section that follows reports the sample selection, instrumentation used and procedures followed for the data collection. A detailed explanation of the data analysis used in the study precedes the results section which employs a variety of different statistical techniques. The discussion of the results concludes the chapter, from applied and theoretical standpoints.

### 4.2 REVIEW OF RELEVANT LITERATURE

#### 4.2.1 PERCEPTIONS OF CONTROL

Emanating from the results of the previous study, an important variable which is likely to be a significant source of variance in directional interpretations is that of an individual's perception of control. It is hypothesised that it is those performers who do not possess confidence in their ability to control both themselves and the environment (i.e., their behaviour and performance) in order to achieve their goals who will experience debilitative anxiety symptoms (cf. Borkovec et al., 1986; Carver & Scheier, 1988, 1992; Eysenck, 1992). The following review focuses on the work of these researchers in detail, concentrating specifically on control, attainment of goals and debilitative interpretations of anxiety.

#### 4.2.1 Perceptions of Control: Research Findings

The initial stimulus for the research question generated from Borkovec et al.'s (1986) research investigating the concept of 'worry'. Although this research was not directed solely at anxiety, Eysenck (1992) emphasised that worry has obvious relevance to anxiety, and indeed strong evidence exists that worry is an important component of
trait anxiety. Borkovec et al. stated that worry can be understood within a complex theoretical formulation including elements of learning theory, cognitive processes and self-theory. With reference to the last of these theories, Borkovec and associates highlighted that frustrating non-reward (i.e. failing to achieve a goal) can produce a self-evaluative state which may serve to generate worry. Specifically, one of the implications of this position is that individuals who have the least confidence in their own ability to control themselves and the environment in order to achieve their goals should be most vulnerable to worry. It is important to highlight, as noted by Eysenck (1992), that Borkovec's research while useful in raising this issue, is extremely complicated and a lack of research exists which has addressed its central focus.

Eysenck (1992) further stated that one may assume that worries occur in response to the actual or potential non-achievement of goals associated with major sources of life satisfaction. A major source of satisfaction for dedicated sports performers would undoubtedly be the achievement of their competitive goals. Eysenck highlighted the importance of perceived uncontrollability as a factor involved in anxiety. Eysenck cited Mineka and Kihlstrom's (1978) research to highlight the importance of perceived control in anxiety manifestation. Specifically, Mineka and Kihlstrom (1978) extensively reviewed the animal literature with its paradigms for creating anxiety. They concluded that anxiety manifests itself in every paradigm because "environmental events of vital importance to the organism become unpredictable, uncontrollable or both" (p.257).

The work of Carver and Scheier is particularly relevant in the context of the present study. Since 1979, Carver and Scheier have extensively researched processes in the self-regulation of human behaviour, including the examination of anxiety effects (Carver, Blaney & Scheier, 1979; Carver, Peterson, Follansbee & Scheier, 1983; Carver & Scheier, 1984, 1988, 1992; Carver, Scheier & Klahr, 1987). Much of the empirical work testing the predictions of Carver and Scheier has been conducted in the area of test anxiety in relation to test (i.e. cognitive) performance.

Their proposals are based on the view that human behaviour is regulated in a system of feedback control (Carver & Scheier, 1981, 1986) in which individuals continually establish goals for themselves which they use as reference points. These goals vary from very short-term aims to much longer-term goals. The authors assume behaviour is goal directed and that peoples' goals give form and direction to their lives. Furthermore, as individuals act, they themselves monitor their own behaviour with regard to the reference points (i.e. the goals that have been set) and make adjustments accordingly (Carver & Scheier, 1988). This is the central tenet of feedback control. Consequently, when individuals pursue these goals, their self-regulatory efforts take the form of feedback loops continually attempting to achieve these goals.
The presence of anxiety can result in difficulty occurring in the execution of self-regulation when conflict arises between competing reference values. The authors explain that the aspect of anxiety with which they are concerned focuses on its impact on human behaviour. Specifically, their concerns centre around how people respond when they experience anxiety. Importantly, in the context of this study, Carver and Scheier recognise that anxiety does not automatically impair performance and can result in an energising and focusing effect on the individual who is experiencing the emotion. They go on to explain that the effects of anxiety on performance depends on how the individual orients and responds to the anxiety and the situation. Encouragingly, the authors disagree with the traditional view that anxiety causes a negative disruption in behaviour, because of what they term a critical variable which causes a variation in the individual's response pattern. The critical variable influencing whether anxiety is debilitative or facilitative is the person's expectancy (favourable versus unfavourable) of being able to cope with the anxiety and complete the action being attempted. Individuals who expect to be able to cope and who are confident of being able to complete the action will respond to the anxiety with a self-focus on task engagement. This will result in renewed effort, enhanced persistence and even enhanced performance. Conversely, individuals who are not confident and doubt their ability to cope and who have negative expectancies will experience debilitative anxiety in the form of self-deprecatory self-focus and experience the desire to withdraw or disengage from the action.

Support for Carver and Scheier's predictions has been provided by Rich and Woolever (1988). Their study involved the experimental manipulation of highly-test anxious subjects' expectancies of performance on a specific test. Those subjects who were doubtful (negative expectancy) about their performance were impaired by self-focus; those who were confident about their performance (positive expectancy), on the other hand, were facilitated by self-focus. It is interesting to highlight that facilitating and debilitating effects of the anxiety occurred among subjects who were high in test anxiety. Rich and Woolever (1988) expressed how these findings indicated the importance of expectancies in determining an individual's reaction to experiencing anxiety.

In summary, the previous research, although predominantly in the area of test anxiety (examining the tendency to become anxious before and during examinations, under highly evaluative conditions) has generated an interesting stimulus for research in the area of competitive anxiety with regard to the common practice of goal setting. Specifically, the findings raise important questions relating to sports performers' perceptions of control in relation to the goals that they set for competition, and the resulting consequences for interpreting their pre-competition anxiety as either facilitative or debilitating for performance.
4.212 Jones' Control Model (1995a)

As alluded to previously, the predictions of Carver and Scheier's research have been examined empirically in the area of test anxiety investigating cognitive performance, and have provided valuable findings for future research in associated areas. However, the predictions are lacking empirical investigation in the motor performance domain. Responding to this situation, Jones (1995a) has recently modified and adapted Carver and Scheier's model to accommodate predictions for the competitive anxiety response in sporting situations (see Figure 4.1).

Figure 4.1  A Control Model of Debilitative and Facilitative Competitive State Anxiety (Jones, 1995a)

In the model, control is broadly conceptualised as the cognitive appraisal of the degree of control the performer is able to exert over both the environment and the self (Eysenck, 1992); that is, over behaviour and performance. Performers who perceive themselves to be able to cope and to be able to achieve their goals are predicted to interpret their anxiety symptoms as facilitative; performers who perceive themselves not
to be in control and who have negative expectancies regarding goal attainment are predicted to interpret their symptoms as debilitative.

The central focus of Jones' (1995a) model is clearly on the behaviour of sports performers in competitive situations. The model is directed towards the attainment of goals, and the individuals positive or negative expectancies of goal attainment. Consequently, the next section of the relevant literature reviews and discusses the extensive area of goal setting.

4.22 GOAL SETTING

Goal setting is extremely relevant in practically all areas of life when one is attempting to direct behaviour. Harris and Harris (1984) defined goal setting as "simply identifying what you are trying to do or accomplish; basically it is the aim of an action or series of actions" (p.121). Goals are set in all environments ranging from educational establishments, industrial, management and organisational settings and more recently in the area of competitive sport. The aim of goals, when set correctly, is to provide specific targets in order to increase motivation, direct and focus attention, increase effort and encourage persistence (Burton, 1992). Beggs (1990) highlighted that the practice of setting goals is not a new one; indeed, psychologists have been developing theories of goals since the early 1920's. However, the vast majority of early research was directed neither towards sport nor competitive anxiety. A review of this vast area in its entirety is beyond the scope of this study; however, the central tenets of goal setting theory and significant early research findings are discussed.

4.2.21 Early Findings and Goal Setting Principles

Goal setting as a motivational approach has received an extensive amount of research attention in management and organisational settings where the primary concern centred around maximising output and the cost effectiveness of certain techniques in industry. The vast majority of early empirical research in the area was conducted by Edwin Locke (1966, 1968) which laid the foundations for future work into the area. His goal-directed model of motivation forwarded two major postulates. Firstly, difficult goals if accepted, lead to higher levels of task performance than do easy goals. Secondly, specific, difficult goals lead to higher performance than general goals, "do your best" goals or no goals at all. Research evidence supporting these two central premises included Locke, Shaw, Saari and Latham's (1981) analysis, which demonstrated that in 48 out of 57 cases studied hard tasks led to better performance than medium or easy goals. Also, Locke et al. (1981) concluded that in 53 of the 57 studies reviewed, only two
studies failed to show that specific and challenging goals produced better performances than "do your best" or no goals.

Erez and Zidon (1984) additionally examined the 'difficulty' and 'acceptance' relationship in goal setting, establishing that goal acceptance is indeed a key variable. Specifically, the relationship between difficulty and performance was positive and linear when the goal was accepted, but negative and linear when the goal was not accepted, indicating that goals must be accepted if they are to be effective. Additional factors important in goal setting relate to 'effort' (Stedry & Kay, 1966) and goal proximity (Locke & Latham, 1985).

It is important to highlight that this section has only just touched the surface of the extensive research carried out into goal setting in management and organisational settings. For early reviews see Locke (1968), Latham and Yukl (1975), and Locke et al. (1981). More recently, see Locke and Latham (1990) for a detailed review and critique of the early goal setting research. Additionally, for meta-analytic studies refer to Chidester and Grigsby (1984), Locke, Feren, McCaleb, Shaw and Denney (1980) and Tubbs (1986).

4.222 The Application of Goal Setting to Competitive Sports

Research into goal setting in sport has grown in recent years, after initially borrowing principles from management and organisational settings. Locke and Latham (1985) advocated that the findings from management and industrial settings were transferable and could be applied to sport, whilst also recommending future research directions specifically in the area. As a result, coaches and athletes have adopted strategies that were initially developed from non-sport related areas. The transferability of these findings is however, suspect, in that research into goal setting in sport has provided inconsistent support for the basic premises of Locke (1968).

Support has been provided in certain studies replicating Locke’s (1968) proposals (Burton, 1989a; Hall, Weinberg & Jackson, 1987; Tenenbaum, Pinchas, Elbaz, Bar-Eli & Weinberg, 1991; Weinberg, Bruya, Longino & Jackson, 1988). Specifically, Botterill (1977) found that when subjects were given specific, challenging goals in an endurance task, they performed better than when they were simply required to "do their best". Barnett and Stanicek (1979) showed that specific numerical goals led to higher scores in archery than goal-free control conditions. Conversely, some research studies failed to report performance differences of any significance between specific, difficult goals and "do your best" goals (Barnett, 1977; Hall et al., 1987; Hollingsworth, 1975; Weinberg, Bruya & Jackson, 1985; Weinberg, Bruya, Garland & Jackson, 1990; Weinberg, Bruya, Jackson & Garland, 1987; Weinberg, Fowler, Jackson, Bagnall & Bruya, 1991). Specifically, Hollingsworth’s (1975) and Barnett’s (1977) research established no
differences in juggling performance between groups with specific goals, and groups where no goal was set. Furthermore, Hall et al. (1987) did not support the assignment of specific goals with improved dynamometer endurance task performance. Pertaining to these latter findings, Locke and Latham (1985) advocated that although goals should be difficult, they should be realistic, or performance will be debilitated due to decreases in motivation towards attaining an unrealistic unachievable goal. However, the previous studies, primarily by Weinberg and colleagues, report no reductions in performance despite difficulty levels increasing beyond realistic level.

An extensive amount of research attention in sport psychology has attempted to explain these inconsistencies. However, a comprehensive review of this literature is beyond the scope of this chapter, and to a degree irrelevant, in the context of this study. Briefly, however, researchers such as Locke (1991) attributed methodological flaws in the sport psychology literature, such as subjects setting their own specific goals, social comparison effects, a failure to measure personal goals and inappropriate difficulty levels. Weinberg (1992) highlighted other problems such as the spontaneous goal-setting by subjects in control conditions which served to confound the results. Weinberg (1994) additionally reported that the type of task performed and individual difference variables should be taken into account. Specifically, tasks such as grip strength with low ecological validity have been inappropriate to test the hypotheses, and subjects in the typical environments of exercise classes that are already highly motivated are not typical of competitive sport populations. Burton (1993) correctly pointed out that competitive sports performers possibly operate closer to their performance potential than subjects examined in industrial settings. Recently, inconsistencies have been explained by the study designs that researchers have traditionally adopted. This issue has been addressed with research being carried out on tasks with higher ecological validity (Anderson, Crowell, Doman & Howard, 1988; Burton, 1989a; Sticher, 1989; Swain & Jones, 1996). Attempts to redress the balance of studies high in ecological validity has been strengthened by a small number of studies examining goal setting in naturalistic settings therefore maximising external validity in sport settings (Anderson et al., 1988; Burton, 1989a; Weinberg, Sticher & Richardson, 1994).

4.223 The Relationship Between Goal Setting and Anxiety

Confounding the proposals that goal setting is a valuable method of directing behaviour and increasing motivation and self-confidence (Locke & Latham, 1985), it is important to highlight that goals can also act as a source of stress and anxiety, thereby becoming dysfunctional and harmful to performers (Beggs, 1990; Burton, 1989b, 1992, Cale & Jones, 1989; Earley, Connolly & Ekegren, 1989; Hanton & Jones, 1995; Jones
and Cale, in press; Jones, Swain & Cale, 1990). Research attention investigating the relationship between goals and anxiety in sport psychology has not been particularly forthcoming and only a scant amount of evidence is available. This is surprising in view of the fact that research demonstrates that competition is more stressful than training environments where the goal setting relationship has typically been examined (Passer, 1981).

Hardy, Maiden and Sherry (1986) went some way to redressing the paucity of research examining these variables. They investigated the effects of anxiety on goal acceptance and attainment on six varsity soccer players. Competitive anxiety (measured via the CSAI-2) was manipulated in a time-to-event paradigm in which anxiety was expected to be at its peak close to the competition, and lower on the days before and after the event. Subjects were required to perform an ecologically valid skill (football juggling) on the different days where levels of global acceptance and attainment were measured. Both acceptance and attainment decreased with increases in anxiety. The researchers concluded that when the subjects experienced anxiety there was a decrease in the individual's perception of their ability to achieve goals which had previously been accepted and earlier been achieved in the low anxiety conditions prior to the competition.

Cale and Jones (1989) measured cognitive anxiety, somatic anxiety and self-confidence via the CSAI-2, and also goal acceptance and performance in different goal difficulty conditions (very easy, challenging and very difficult). Supporting the trend reported by Erez and Zidon (1984), easy goals were universally accepted, challenging goals were greeted with varying degrees of acceptance and very difficult goals were rejected. Interestingly, although somatic anxiety was not affected by goal difficulty, cognitive anxiety increased prior to attempts at the challenging and difficult goals. This was also accompanied by a reduction in self-confidence.

Jones and Cale (in press) examined the interaction between goal setting, multidimensional state anxiety (measured via the CSAI-2) and perceptuo-motor performance in 44 collegiate students who completed a series of perceptual speed trials in two different conditions. Goals set in the first trial were "do your best" targets; however, in the second trial (treatment condition) increasingly difficult and specific goals were assigned. Results indicated that increases in levels of cognitive anxiety and decreases in self-confidence accompanied increases in goal difficulty in the treatment condition.

Redressing the balance further, some interesting findings have emerged recently in studies examining the situational antecedents of multidimensional state anxiety. The findings are important in that the studies did investigate the relationship in an ecologically valid and naturalistic sporting context.
Jones et al. (1990) investigated the situational antecedents of state anxiety in a sample (n=125) of elite male intercollegiate runners. Interestingly, a 'position goal' factor which asked the athletes about the difficulty of the goal and their capacity to achieve it predicted the cognitive anxiety subcomponent. Specifically, these results revealed that the greater the difficulty of position goals set by the athletes in the pre-race period and the lower the expectation of success, the higher the level of cognitive anxiety. Failing to support these findings, Hanton & Jones (1995) established that the position goals set in a sample of elite swimmers predicted somatic anxiety and not cognitive anxiety as in the case of Jones et al.'s study. This was surprising and difficult to explain, but highlights an interesting relationship between goal setting and somatic anxiety that clearly requires future research attention. It should be highlighted that, although these two studies provide useful findings, 'position goal' only accounted for a small percentage of the variance in each study and did not emerge as the major predictor of the anxiety subcomponents.

Taken collectively, these studies demonstrate the importance of setting goals at the correct difficulty levels for performers in competitions. Specifically, goals may become dysfunctional in situations when athletes are already under pressure and inappropriate goal setting may lead to detriments in performance (Earley et al., 1989). However, following the trend in other areas of anxiety research, studies have tended to examine the relationship between goal setting and anxiety intensity levels. No research to date has examined the effects of the relationship upon the directional interpretations of anxiety symptoms.

4.224 Different Goal Types

In the context of this study, it is important to distinguish between at least three different types of goal that have been identified in the sport psychology applied literature: outcome, performance and process goals. Recent research has been encouraging in that it has started to address more closely the different types of goals that performers typically set (Burton, 1989b 1993; Hardy et al., in press; Hardy & Jones, 1994).

'Outcome' goals focus upon the outcomes of particular events and usually involve interpersonal comparisons of some kind; for example, finishing a 100 metre freestyle race in first place. Outcome or position goals may significantly enhance motivation on a short term basis; however, in the longer-term they may lead to drop-out from the sport (Roberts, 1986). Interestingly, research has demonstrated that outcome goals are associated with higher levels of state anxiety than performance-related targets (Burton, 1989b).
'Performance' goals specify an end product of performance that is easily measurable and will be achieved by the performer relatively independently of other performers; for example, swimming the 100 metre freestyle in a designated time. From an applied perspective, and as a result of Burton's (1989b) finding, Gould (1993) advocated the practice of setting performance goals rather than, or at least in conjunction with, outcome goals.

'Process' goals specify the processes in which the performer will engage during the race. Examples might include staying focused or relaxed, maintaining an even pace during the race or achieving a fast dynamic start to the event. Only a scant amount of previous research has addressed the impact of process goals. Hardy and Nelson (1988) suggested that process goals may influence performance via the allocation of attentional resources. Also, Kingston and Hardy (1994) reported that golfers who trained in the use of process goals had better concentration, increased self-efficacy, and were more able to control negative expectancies. Interestingly, the performance of these golfers also significantly improved over the process goal training period of five months. It should be recognised that process goals may become more important in the training phases in competitive sports, whereas performance and outcome goals may be the primary goals at the competition (cf. Burton, 1993). This is an interesting proposition and intuitively appealing; however, research to investigate the types of goal set requires further attention.

In the context of Jones' (1995a) model, the link between different goal type and interpretation of anxiety symptoms as being debilitative or facilitative lies in the degree of (perceived) control the performer is able to exert over goal achievement. The attainment of an outcome goal, because it is the result of interpersonal comparison, is not totally within the performer's control. Performance and process goal attainment, on the other hand, is independent of other performers and within the performer's control. Consequently, outcome goals are associated with higher anxiety than performance or process goals (Burton, 1989b). Thus, a link has already been established between goal type and intensity of anxiety symptoms, but no research has examined the debilitative and facilitative dimensions of anxiety as a function of goal type. Due to the important differences in 'controllability' across the three types of goal, it cannot be assumed that the predictions of Jones' model will be supported to the same degree in all three cases. It could be speculated that performers who have positive expectancies of attaining outcome goals do not have the same level of perceived control, due to the inherent uncertainty, as in the case of positive expectancies regarding performance and process goals. Therefore, the level of facilitation of anxiety symptoms associated with positive expectancies of attaining outcome goals may be less than for performance and process goals.
4.3 STUDY 2: PURPOSE OF THE STUDY

The major purpose of the study was exploratory and sought to examine Jones' (1995a) model which predicts that performers' directional interpretations of their cognitive and somatic anxiety symptoms are a function of goal attainment expectancies. Specifically, this study examined the directional interpretations of anxiety as a function of the expectancies of achieving outcome, performance and process goals during the period preceding an important race in a sample of high standard competitive swimmers.

As alluded to in the previous study, the performer's own labelling of pre-competition symptoms would appear to be of importance in explaining cognitive and perceived physiological pre-competitive states. Therefore, a secondary purpose of the study was also exploratory in nature and sought to examine the face validity of the direction scale of the modified CSAI-2 using an adjective labelling list which included both positive and negative emotional labels. This was examined as a function of whether subjects reported their cognitive and physiological symptoms as facilitative or debilitating. The author recognises that psychometric properties of this scale were reported in the previous chapter (section 3.51). Therefore, the rationale for including this procedure and purpose was as an additional validation check on the direction scale.

4.3.1 HYPOTHESES

Due to the exploratory nature of this experiment and in view of the fact that no studies have directly examined directional perceptions in sport relative to expectations of goal achievement, only general hypotheses were formulated. Therefore, in accordance with the predictions of Jones' (1995a) model, it was expected that:

(1) No differences would be evident in intensity levels of the two goal expectancy groups (negative/uncertain and positive);

(2) Performers with positive goal expectancies would report their anxiety symptoms as being more facilitative than those who had negative or uncertain expectancies;

(3) The performers who experienced their anxiety as facilitative would signify more positive and less negative labels on the adjective list than those who perceived their anxiety as debilitating.
4.4 METHOD

4.4.1 SUBJECTS

The subjects comprised 91 competitive swimmers from a wide range of swimming events whose ages ranged from 14 to 28 years with a mean age of 18.98 (SD=2.84). The sample included 45 males (M=19.46, SD=2.85) and 46 females (M=18.33, SD=2.71). The sample was drawn from four different swim mees during the 1993 and 1994 seasons. The standard of the swimmers ranged from those who had represented their district (e.g. Midland district; Southern Counties etc.) to those who had represented their country. The majority of the subjects were examined at one particular competition venue, the British Students Sports Federation Open National Short Course Championships in Wolverhampton (n=60). Additional data was collected in District (n=15), a National Student League (n=8), and a Grand Prix meet in Gloucester (n=8).

4.4.2 INSTRUMENTATION

4.4.2.1 Modified Version of the CSAI-2

The CSAI-2 was used to measure pre-performance cognitive and somatic anxiety. The scale also includes a self-confidence subscale which was excluded for the purpose of this study. The scale therefore comprises 18 items, with nine items in each subscale. Additionally, the direction scale developed by Jones and Swain (1992) was included, in which each subject rated the degree to which the experienced intensity of each symptom was either facilitative or debilitative to subsequent performance (see Appendix 6).

4.4.2.2 Adjective Labelling List

The adjective labelling list comprises 22 adjective labels. These were divided into 11 adjective labels which were deemed to represent a positive state (e.g. motivated, determined, excited, focused) and 11 which were deemed to reflect a negative state (e.g. doubtful, scared, lethargic, distressed). The adjectives were generated from a pilot study in which sports performers identified all of the possible emotions they might experience prior to an important event.

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4.1 For specific details on the modified version of the CSAI-2 refer to the methodology reported in Chapter 3 (Study 1; section 3.4.2.1)

4.2 Self-confidence was removed from the study for two reasons. Firstly, because Jones' (1995a) model forwards no predictions regarding this subcomponent. Practical concerns were the second reason for the exclusion of self-confidence, i.e., the relatively time consuming nature of the completion of more than one questionnaire in the pre-race period.
Subjects were asked to tick those adjectives which best described their overall feelings at the time of completing the modified CSAI-2. Scores for this scale were derived by separately summing the total number of positive and negative adjectives ticked, with possible scores on each ranging from 0 to 11 (see Appendix 7).

4.423 Goal Attainment Expectancy Scale

This questionnaire was designed to assess the degree to which the subjects thought they were capable of achieving the goals that had been set for their upcoming competitive race. The written instructions provided to the swimmers on the Goal Attainment Expectancy Scale were as follows:

"Goal setting is about setting targets for performance. There are essentially three different types of goal that performers may set themselves for a race. These are: (1) outcome goals (e.g. the position you aim to achieve in the race); (2) performance goals (e.g. the time you aim to swim for the race); (3) process goals (e.g. achieving a fast start, streamlined turns, efficient stroke technique etc.). For this study refer to the goals that may have been set for the next race. Please note that it is possible to set more than one type of goal."

The scale is divided into three sections which ask about outcome (i.e. position), performance (i.e. time), and process goals (e.g. starts, turns, stroke technique etc.) respectively. Within each section, participants were asked to specify the goal (if applicable) they had set for the race. For each goal that had been set, participants then responded to the question: "To what extent do you think you will achieve the goal?". The response scale ranged from -4 ("definitely no") to +4 ("definitely yes"), with the midpoint of 0 representing "uncertain" (see Appendix 8).

4.43 PROCEDURE

Formal permission was requested from and granted by the swim meet organisers to approach coaches and swimmers at the meets for the purposes of collecting the data. The modified CSAI-2, goal attainment expectancy scale and adjective labelling list were administered in that order, approximately one hour prior to the individuals' competitive events. This time frame was adopted in Study 1, and also previously employed by Jones et al. (1990). One hour prior to competing was regarded as an acceptable time to complete the questionnaires because it did not interfere with the swimmers warm-up session. Prior to completion of the modified CSAI-2, each swimmer was presented with standardised instructions\textsuperscript{4.3} based upon the recommendations of Martens et al. (1990).

\textsuperscript{4.3} Refer to Chapter 3 (Study 1; section 3.43) for further details on the administration of the modified CSAI-2.
These emphasised the confidentiality of responses at an individual level, the need for honesty and an indication of their thoughts and feelings "right now". The completion times for the three questionnaires ranged from 10 to 15 minutes and were completed without any external interference. The author was present at all times to ensure that the participants were not sampled more than once across the four different competition venues.

4.44 DATA ANALYSIS

The analysis of the data was divided into four main stages. The first stage involved analysing the internal reliabilities for this sample of the direction dimensions of the cognitive and somatic anxiety scales. Correlations among the intensity and direction subscales, and descriptive data (means and standard deviations) for each of the cognitive and somatic anxiety intensity and direction scores are also reported. The second stage involved the simple calculation of the frequency of the various types of goal, and their combinations, set by the swimmers.

Stage three involved the creation of the facilitated/debilitated independent variable highlighted in the previous study (see section 3.53). To recap, subjects were dichotomised into those who had negative scores ('debilitated' group) and those who had positive scores ('facilitated' group) on both direction variables. Following this procedure a one-way MANOVA was carried out on the adjective labelling list items with the positive and negative labels acting as the dependent variables. Univariate follow-up ANOVAs were then conducted in the case of significant MANOVA effects.

The fourth stage in the analysis involved dividing participants into 'negative/uncertain' and 'positive' groups based on their expectancies of goal attainment. Specifically, participants who responded with a positive score to the question "To what extent do you think you will achieve the goal?" comprised the positive group, while those with a negative score and a score of 0 comprised the negative/uncertain group. These groups were created for each of the outcome, performance and process goals. Separate multivariate analyses of variance (MANOVAs) within each of the three goal types were then conducted with cognitive and somatic anxiety intensity and direction scores as the dependent variables, and with group (i.e. negative/uncertain versus positive) as the independent variable. These analyses were only conducted on those participants who had set goals in all three categories so that the same sample was analysed across the different goal types. Follow-up univariate ANOVAs were conducted in the cases of significant MANOVA effects.
4.5 RESULTS

4.51 RELIABILITY ANALYSES, CORRELATIONS AND DESCRIPTIVE DATA

Following the general procedures of the previous study, split-half internal reliability analyses were conducted on the cognitive and somatic anxiety direction subscales. The coefficients for the present sample of swimmers was 0.89 for cognitive anxiety direction and 0.81 for somatic anxiety direction. These values are again acceptable, and actually higher than those reported in the previous study and the research carried out by Swain and Jones (1996).

The correlation coefficient between the intensity scores for cognitive and somatic anxiety was 0.52, and was of a similar magnitude to that found in the previous studies. The correlations between cognitive anxiety intensity and direction and somatic anxiety intensity and direction scores were -0.35 and -0.29 respectively. These values demonstrate less than 13% common variance at best, and provide further support for the separate measurement of intensity and direction dimensions of the competitive anxiety response.

The mean scores for the intensity of cognitive and somatic anxiety were 19.20 (SD=4.57) and 16.9 (SD=4.73) respectively. When compared to CSAI-2 norms for swimmers reported by Martens et al. (1990), the somatic anxiety intensity score equates approximately to the 50th percentile, while the cognitive anxiety intensity score for the sample of swimmers in this study equates approximately to the 70th percentile. Mean scores for direction were 2.96 (SD=9.24) for cognitive anxiety and 5.05 (SD=7.49) for somatic anxiety.

4.52 FREQUENCY OF THE VARIOUS TYPES OF GOALS SET BY THE SUBJECTS

Table 4.1 shows the frequency of the various types of goal, and their combinations, set by the swimmers. The vast majority of the sample set at least two types of goal, with nearly half setting a combination of all three types. None of the swimmers set outcome goals only. Interestingly, a third of the swimmers (n=31) reported that they did not set outcome goals at all. By contrast, only 12 of the swimmers did not set a goal in each of the performance and process goal types. Examples of outcome goals set by the swimmers included winning the race and achieving a top three finish. Performance goals included achieving personal best times, a season's best time, and achieving qualifying times for future competitions such as the National Championships. Finally, the types of
process goals set by the swimmers included fast turns, staying focused and relaxed during the race, and streamlining from the wall following starts and turns.

Table 4.1 Frequency of Types of Goals set by the Swimmers (N=91)

<table>
<thead>
<tr>
<th>Goal Type</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>No goals</td>
<td>0</td>
</tr>
<tr>
<td>Outcome only</td>
<td>0</td>
</tr>
<tr>
<td>Performance only</td>
<td>6</td>
</tr>
<tr>
<td>Process only</td>
<td>3</td>
</tr>
<tr>
<td>Outcome and performance only</td>
<td>6</td>
</tr>
<tr>
<td>Outcome and process only</td>
<td>9</td>
</tr>
<tr>
<td>Performance and process only</td>
<td>22</td>
</tr>
<tr>
<td>Outcome, performance and process goals</td>
<td>45</td>
</tr>
</tbody>
</table>

4.53 POSITIVE AND NEGATIVE ADJECTIVE LABELLING AS A FUNCTION OF DEBILITATIVE AND FACILITATIVE INTERPRETATIONS OF ANXIETY

Following the procedure employed by Jones, Hanton and Swain (1994), an independent variable was created which was derived from each subject's scores on the cognitive anxiety and somatic anxiety direction variables. Specifically, subjects were dichotomised into those who had negative scores ('debilitated' group) and those who had positive scores ('facilitated' group) on both of the direction variables. Thus, the debilitated group comprised those subjects who had negative scores on both cognitive and somatic anxiety direction (n=21), and the facilitated group consisted of those subjects who had positive scores on both (n=45). Those subjects who had a combination of a positive score and a negative score (n=25) were omitted from subsequent analyses.

4.531 "Multivariate" Analysis of Variance (MANOVA)

A one-way MANOVA was conducted to establish if any overall significant differences were evident between the debilitated and facilitated groups' scores on the number of positive and negative labels from the adjective labelling list. Specifically, the debilitated and facilitated groups acted as the independent variable and total scores on positive and negative labels as dependent variables. The results indicated that the MANOVA was significant Wilks lambda = 0.73, F (2. 63) = 11.81; p <.001).
Table 4.2  Means, Standard Deviations and F Ratios for One-Way Analyses of Variance on Adjective Labelling

<table>
<thead>
<tr>
<th></th>
<th>FACILITATED [N= 45]</th>
<th>DEBILITATED [N= 21]</th>
<th>df</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Labels</td>
<td>4.80 (2.52)</td>
<td>2.48 (2.084)</td>
<td>1.64</td>
<td>13.65</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Negative Labels</td>
<td>1.18 (1.27)</td>
<td>2.68 (1.91)</td>
<td>1.64</td>
<td>14.18</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

4.532  Analysis of Variance (ANOVA)

Separate univariate one-way analyses were carried out for the positive label and the negative label subscales to examine specific differences between the facilitated and debilitated groups. Table 4.2 presents the means, standard deviations and F-ratios for these analyses. The results illustrate that the facilitated group scored significantly higher on the number of positive labels that they indicated and lower on negative labels they highlighted than the debilitated group. Both ANOVAs reached the .001 level of significance. The ANOVA summary tables are presented in Appendix 9.

4.54  INTENSITY AND DIRECTION SCORES AS A FUNCTION OF GOAL EXPECTANCY

For the purpose of these analyses, a new independent variable was created which was derived by dichotomising the subjects into 'negative/uncertain' and 'positive' groups based on their expectancies of goal attainment. Specifically, subjects who held a positive expectancy to achieve the race goal comprised the positive group, while those who held a negative or uncertain expectation of goal achievement comprised the negative/uncertain group. These groups were created separately for each of the outcome, performance and process goals. Only those subjects who had set goals in each of the three goal types (n=45; 20 males, 25 females) were used in these analyses. Therefore, those subjects who set one or two out of the three possible goals (n=46) were omitted from the subsequent analyses. Separate multivariate and follow-up univariate ANOVAs were carried out for each goal type. Specifically, for each separate goal the goal expectancy groups (negative/uncertain and positive) acted as the independent variable, with cognitive anxiety and somatic anxiety intensity and direction scores acting as the dependent variables.
4.541 Outcome (i.e. Position) Goals

4.5411 "Multivariate" Analyses of Variance (MANOVA)

Of the 45 swimmers who set all three types of goals, 33 had positive and 12 had negative/uncertain attainment expectancies regarding the outcome (position) goals that were set for the race. The results revealed that the MANOVA was significant, Wilks lambda = 0.75, \( F(4, 40) = 3.26; p < .05 \).

4.5412 Analyses of Variance (ANOVA)

Means, standard deviations and F-ratios for the univariate analyses are presented in Table 4.3. Specifically, the groups did not differ on levels of cognitive anxiety and somatic anxiety intensity. However, the positive expectancy group was higher on direction of both cognitive (\( p < .01 \)) and somatic anxiety (\( p < .05 \)) than the negative/uncertain group. The mean scores for cognitive anxiety direction showed clear facilitation (+5.67) for the positive group and debilitation (-2.92) for the negative/uncertain group. In the case of somatic anxiety direction, both groups reported facilitation, but the degree of facilitation was perceived as clearly greater in the positive group with a mean of +7.58 as opposed to +1.58 in the negative/uncertain group. ANOVA summary tables are presented in Appendix 10.

Table 4.3: Means, Standard Deviations and F Ratios for One-Way Analyses of Variance on Outcome Goals (N=45)

<table>
<thead>
<tr>
<th></th>
<th>NEGATIVE/ UNCERTAIN Mean (SD)</th>
<th>POSITIVE Mean (SD)</th>
<th>df</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total No.</td>
<td>12</td>
<td>33</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive Anxiety</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intensity</td>
<td>22.17 (4.02)</td>
<td>19.52 (4.83)</td>
<td>1.43</td>
<td>2.88</td>
<td>NS</td>
</tr>
<tr>
<td>Direction</td>
<td>-2.92 (6.39)</td>
<td>5.67 (9.59)</td>
<td>1.43</td>
<td>8.21</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Somatic Anxiety</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intensity</td>
<td>17.83 (5.64)</td>
<td>17.82 (5.15)</td>
<td>1.43</td>
<td>0.001</td>
<td>NS</td>
</tr>
<tr>
<td>Direction</td>
<td>1.58 (6.23)</td>
<td>7.58 (7.70)</td>
<td>1.43</td>
<td>5.85</td>
<td>&lt;.05</td>
</tr>
</tbody>
</table>
4.542 Performance (i.e. Time) Goals

4.5421 "Multivariate" Analyses of Variance (MANOVA)

In the case of performance goals, 19 of the 45 swimmers under investigation had negative/uncertain attainment expectancies, with the remaining 26 having positive expectancies of goal attainment. The MANOVA was significant, Wilks lambda = 0.65, F(4, 40) = 5.44; p < .01.

4.5422 Analyses of Variance (ANOVA)

The mean values, standard deviations and F-ratios for the univariate analyses of performance goals are presented in Table 4.4. Reiterating the findings from the outcome goals analyses, cognitive anxiety and somatic anxiety intensity scores did not differ between the two groups, but both cognitive anxiety (p<.01) and somatic anxiety (p<.01) direction scores were lower in the negative/uncertain group. Inspection of the mean scores reveals that, as in the case of outcome goals, cognitive anxiety was clearly debilitative (-3.0) in the negative/uncertain group and facilitative (+8.04) in the positive group. Mean scores for the direction of somatic anxiety, on the other hand, again showed differing degrees of facilitation in the two groups with the positive group reporting a mean value of +8.70 compared with +2.26 in the negative/uncertain group. ANOVA summary tables are presented in Appendix 11.

Table 4.4: Means, Standard Deviations and F Ratios for One-Way Analyses of Variance on Performance Goals (N=45)

<table>
<thead>
<tr>
<th></th>
<th>NEGATIVE/UNCERTAIN Mean (SD)</th>
<th>POSITIVE Mean (SD)</th>
<th>df</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total No.</td>
<td>19</td>
<td>26</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive Anxiety</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intensity</td>
<td>21.74 (4.78)</td>
<td>19.12 (4.47)</td>
<td>1.43</td>
<td>3.56</td>
<td>NS</td>
</tr>
<tr>
<td>Direction</td>
<td>-3.00 (5.28)</td>
<td>8.04 (9.39)</td>
<td>1.43</td>
<td>21.26</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Somatic Anxiety</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intensity</td>
<td>19.11 (5.90)</td>
<td>16.89 (4.55)</td>
<td>1.43</td>
<td>2.04</td>
<td>NS</td>
</tr>
<tr>
<td>Direction</td>
<td>2.26 (5.17)</td>
<td>8.70 (8.26)</td>
<td>1.43</td>
<td>8.93</td>
<td>&lt;.01</td>
</tr>
</tbody>
</table>
4.543 Process Goals

4.5431 "Multivariate" Analyses of Variance (MANOVA)
Positive process goal attainment expectancies were reported by 34 of the 45 swimmers, with the remaining 11 reporting negative/uncertain expectancies. As with the previous goal types, the MANOVA was significant, Wilks lambda = 0.76, F(4,40) = 3.09; p < .05.

4.5432 Analyses of Variance (ANOVA)
Table 4.5 presents the means, standard deviations and F-ratios for the univariate analyses of process goals. Again, the groups did not differ on cognitive and somatic anxiety intensity scores, while the positive group were higher (p<.01) on direction scores for both modes of anxiety. The mean scores on direction for the two groups again mirrored the findings for the outcome and performance goals. Somatic anxiety responses only differed on the degree of perceived facilitation with the negative/uncertain group reporting marginal facilitation (+0.73) as opposed to clear facilitation (+7.68) in the positive expectancy group, while cognitive anxiety was facilitative for the positive group (+5.74) but debilitative (-3.91) for the negative/uncertain group. ANOVA summary tables are presented in Appendix 12.

<table>
<thead>
<tr>
<th></th>
<th>NEGATIVE/UNCERTAIN Mean (SD)</th>
<th>POSITIVE Mean (SD)</th>
<th>df</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total No.</td>
<td>11</td>
<td>34</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive Anxiety</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intensity</td>
<td>20.18 (4.58)</td>
<td>20.24 (4.85)</td>
<td>1.43</td>
<td>0.001</td>
<td>NS</td>
</tr>
<tr>
<td>Direction</td>
<td>-3.91 (7.08)</td>
<td>5.74 (9.16)</td>
<td>1.43</td>
<td>10.17</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Somatic Anxiety</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intensity</td>
<td>19.27 (4.15)</td>
<td>17.35 (5.49)</td>
<td>1.43</td>
<td>1.13</td>
<td>NS</td>
</tr>
<tr>
<td>Direction</td>
<td>0.73 (5.29)</td>
<td>7.68 (7.70)</td>
<td>1.43</td>
<td>7.71</td>
<td>&lt;.01</td>
</tr>
</tbody>
</table>
DISCUSSION

The findings from this study provide additional support for distinguishing between intensity and direction dimensions of competitive state anxiety. The results highlight not only the importance of perceptions of control in the context of goal attainment expectancies as variables in the examination of competitive state anxiety, but also the need to investigate the different types of goals that are set at an individual level.

It was hypothesised, that individuals who have a negative perception of control with regard to achieving their goals would experience debilitative interpretations of their anxiety symptoms (Jones, 1995a). Furthermore, the relationship between goal setting and anxiety has received a small amount of research attention, but this has tended to examine the intensity of the response and not the directional interpretations. The present study, therefore, attempted to address both interpretations of anxiety symptoms, and perceptions of control in testing the predictions of Jones' (1995a) model. This was performed in the context of swimmers with positive and negative or uncertain goal attainment expectancies. A second purpose of the study was to examine the face validity of the direction scale of the modified CSAI-2 by the administration of an adjective labelling list including an equal number of positive and negative emotional labels. In accordance with Jones' (1995a) model, general hypotheses predicted that no differences would be evident in intensity levels of the two goal expectancy groups, but performers with positive goal expectancies of goal achievement would report their anxiety symptoms as being more facilitative than those who had negative or uncertain expectancies. Also, the performers who experienced their anxiety as facilitative would signify more positive and less negative labels than those who perceived their anxiety as debilitating.

The findings from this investigation add to the growing body of literature which suggest that competitive anxiety is not necessarily debilitative to sports performers and can have positive performance consequences. Indeed, both cognitive and somatic anxiety were experienced as facilitative by nearly half of the original sample of 91 in this study, with only 23% experiencing both modes of anxiety as debilitative. Such a high proportion of 'facilitators' in this particular sample is probably due to the relatively high skill level of the swimmers who participated in the study. It has been shown in Jones et al.'s (1993) investigation and Study 1 in this thesis that successful sports performers interpret their anxiety symptoms as being more facilitative than less successful athletes. The fact that some sports performers clearly experience positive emotions prior to competing has important measurement implications for future research in this area. Following on from this, the examination of the face validity of the direction scale of the modified CSAI-2 revealed that the facilitated group indicated a greater number of positive
emotional adjectives and a fewer number of negative emotional adjectives than the debilitated group, therefore supporting the study hypothesis. This demonstrates the ability of the direction scale to distinguish between those performers experiencing facilitative and debilitative anxiety states. Researchers have largely assessed negative pre-performance states and examined their relationship with performance. The equivocal findings which have characterised these investigations may be partly due to the lack of assessment of positive states which may be better predictors of performance (cf. Jones, 1995a). These results also reiterate the need to assess performers own labelling of their pre-competitive thoughts and feelings.

Turning to the central focus of the study, it is first of all interesting to observe at a descriptive level the frequency of the types of goals that were set by the swimmers. Not surprisingly, all swimmers set at least one type of goal, but the vast majority set more than one type. The fact that none of the swimmers set solely outcome goals means that all of them set at least one goal type (i.e. performance or process) that could be achieved independently of other swimmers, and could be perceived as being within their personal control. The 45 swimmers who set all three types of goal may have been 'hedging their bets' and providing themselves with an effective coping strategy should one of the goals, and particularly the outcome goal which was not solely under personal control, not be realised. An alternative explanation relates once again to the standard of the sample of swimmers. As alluded to previously, the swimmers from which this sample was drawn were of a very high standard and included national and international representatives. Intuitively, it would not be unreasonable to suggest, that athletes of this calibre would probably adhere to a structured goal setting programme which routinely incorporated all three goal types. Indeed, previous qualitative studies examining elite level performers have reported that these committed performers do employ exact and systematic goal setting strategies (Gould et al., 1992a; Mahoney et al., 1987; Orlick & Partington, 1988). Therefore, it is not surprising that all of the different goal types were set for the swimmers upcoming races.

When considering the extent to which the findings from this investigation support the predictions of Jones' model, it is first important to note, in support of the first hypothesis, that cognitive and somatic anxiety intensity levels did not differ between the two goal attainment expectancy groups across all three types of goals. Additionally, it is also striking to note the anxiety direction scores for each goal type; in each case, both cognitive and somatic anxiety were perceived as more facilitative by swimmers who had positive expectancies of goal attainment than the swimmers who had negative or uncertain expectancies. Thus, the same intensities of the cognitive and somatic responses were interpreted as having different consequences as a function of goal attainment
expectancies. Thus, a clear pattern of results is emerging in the directional perception literature. To elaborate, the previous study in this thesis and research carried out by Jones and Swain (1992) reported a very similar pattern of results. Specifically, although no differences emerged in intensity levels, one group typically reported more facilitative interpretations than other groups. Interestingly, the groups who were reporting facilitative interpretations tended to comprise elite level performers or performers high in competitiveness, and in the context of this study, individuals with very positive expectancies of goal achievement. The common thread therefore pertains to the positive and desirable qualities of sportsmen and women.

Despite these findings, the predictions of Jones' model are not totally supported. Inspection of the mean scores for the two goal attainment expectancy groups shows that both groups interpreted their levels of somatic anxiety as being facilitative in the case of all three types of goals. Jones' model predicts, however, that performers with negative expectancies of goal attainment should interpret their anxiety levels as being debilitative. On the other hand, the mean scores for cognitive anxiety direction provide unequivocal support for Jones' model; in the cases of all three goal types, the positive goal attainment expectancy group interpreted their cognitive anxiety symptoms as being facilitative, while the negative/uncertain group interpreted them as being debilitative.

There are at least two possible interpretations of these findings, which are not mutually exclusive. First, the nature of the sport under investigation is important. Swimming is a sport which requires, among other things, strength, speed, power, and endurance. In other words, increased physiological arousal is a prerequisite for good performance. Somatic anxiety, as measured by the CSAI-2, essentially represents perceptions of physiological arousal, so that increases are likely to be interpreted by the vast majority of swimmers, regardless of goal attainment expectancies, as necessary and facilitative. This would explain the interpretation of somatic anxiety as being facilitative, although to differing degrees, by both groups. Second, it has been proposed that individuals who have least confidence in their ability to control themselves and the environment are particularly prone to worry or cognitive anxiety (Borkovec et al., 1986; Eysenck, 1992). This would help to explain why Jones' predictions received greater support from the cognitive anxiety than the somatic anxiety direction findings.

A further factor to consider regards the support for Jones' predictions offered by the results for the different goal types. The percentage of variance in the dependent variable that can be attributed to group differences can be inferred by calculating eta-squared (1-lambda). Thus, group differences accounted for 25% of the variance in anxiety intensity and direction scores in outcome goals, 35% in the case of performance goals, and 24% in the case of process goals. Therefore, the predictions of Jones' model are best
supported by perceptions of control over performance goals, with there being a negligible
difference between outcome and process goals. Performance goals are those which are
independent of other performers and which allow a greater degree of perceived control
than outcome goals. Also the fact that performance goals are generally easily measurable
and observable may account for their greater predictive value in the context of the model
under investigation than process goals. This may be the result of less uncertainty involved
in perceiving control over something tangible rather than the often subjective nature of
process goals.

Future research in this area should examine the generalisability of the findings of
this study. Swimming is largely an individually-oriented, closed skill sport in which the
environment is relatively constant. Open skill, team sports, in which outcome is the
product of interactive performances in a constantly changing environment, represent a
different context in which the nature of the goals that are set and the perceptions of
control may differ from those of the swimming environment. Additionally, goal
importance is a key factor in understanding emotional or affective experience (Locke &
Latham, 1990; Carver & Scheier, 1992) and should be investigated in future related
research.

Furthermore, in view of the fact that this study, and the study reported in the
previous chapter, have provided evidence that pre-competitive anxiety is not necessarily
debilitative towards performance, investigating how a facilitative interpretation of
thoughts and feelings prior to competition is acquired by the performer would appear be a
very worthy question to address.

This investigation has generated interesting findings which serve to further
understanding of the relationship between goal attainment expectancies and debilitative
and facilitative competitive anxiety. They also have important practical implications for
achieving appropriate pre-performance states via goal setting strategies. Specifically,
coaches and swimmers should be aware that setting goals which are unattainable and
which the performer feels are outside their control may become dysfunctional and lead to
debilitative interpretations of pre-competitive anxiety symptoms.
CHAPTER V

STUDY 3

THE DEVELOPMENT OF COGNITIVE SKILLS AND STRATEGIES IN ELITE SPORTS PERFORMERS:

MAKING THE BUTTERFLIES FLY IN FORMATION

5.1 INTRODUCTION

The previous two studies have highlighted the importance of investigating the directional perceptions of performers in the examination of the competitive state anxiety response. Specifically, Study 1 provided interesting findings regarding how performers of different skill levels interpret their anxiety symptoms, with elite performers reporting more facilitative interpretations than non-elite performers. Furthermore, Study 2 provided evidence that perceptions of control over goal attainment expectancies mediate directional interpretations. Specifically, performers holding favourable expectancies of goal achievement reported more facilitative interpretations than performers with negative or uncertain expectancies. An important question that was generated, primarily from the first study, but reiterated in the second study, related to how elite sports performers have acquired the ability to interpret their anxiety symptoms as being facilitative.

Study 3, therefore, addresses how elite performers have acquired the cognitive skills and strategies which enable them to interpret their pre-race thoughts and feelings as facilitative. This question elaborates on the individual difference variable of skill level from Study 1, and also the control aspect of the second study. To appropriately address the research question, it was decided to incorporate qualitative methods and an inductive analytic approach. Consequently, these issues were studied using retrospective structured interview techniques, consisting of open-ended and follow-up questions. This particular
research methodology has not been previously employed to examine the notion of debilitative and facilitative anxiety. The performers interviewed were ten current male elite swimmers including major games gold medal winners and record holders.

This chapter follows a similar structure to the previous two studies. However, due to the different methodology that was employed, the content differs markedly. The review of relevant literature firstly discusses qualitative research and provides a coherency to the research methods that will be described in the methodology. The literature then focuses on studies conducted mostly with elite figure skaters and wrestlers that have adopted this particular method of enquiry. The review of literature is followed by the study purpose and hypotheses. The methodology section provides details of selecting the subjects for the study and the interview instrumentation and procedures. Qualitative data analysis procedures are then described and explained along with the findings of the study. The discussion which follows, concludes with the methodological considerations, practical implications and future directions that can be drawn from a qualitative study.

5.2 REVIEW OF RELEVANT LITERATURE

5.21 QUALITATIVE RESEARCH METHODS

The quantitative research paradigm has received considerable attention in the area of sport psychology. A significant amount of the research questions have been addressed by the application of statistical analyses to numerical data. This method pursues objective knowledge of universal laws of cause and effect through testing specific hypotheses (Henwood & Nicolson, 1995). Conversely, the qualitative research paradigm rests on adoption of an epistemological position referred to as 'constructivism', as opposed to the quantitative position of 'empiricism'. The research within this paradigm includes more open-ended and detailed analysis of verbal, written or visual material which has not been converted to numerical data scales. Qualitative research has been characterised by the search for understanding of social activities and meanings, and is sensitive to peoples' own understandings as seen from their viewpoint. Bryman (1988) suggested that the choice between the two methods is a practical matter of deciding the one most suited to the research question to be addressed. Some involve the use of numerical data gathering and treatment, and the other requires gathering and analysing unstructured, non-numerical material such as interviews. In view of the exploratory nature of the research question, it was decided to use qualitative methods of enquiry rather than examine the issues using questionnaire methods.
The purpose of the following section is to provide an underlying coherency to the research methods that will be described later in this chapter, and not a detailed discussion of qualitative methods in their entirety. Consequently, this section will focus on the specific qualitative techniques and analyses used in Study 3.

5.211 Structured Retrospective Interviews

A number of recent research studies have successfully adapted qualitative methods of enquiry into sport psychology via the use of structured retrospective interviews (Gould et al., 1992a, 1992b, 1993a, 1993b; Gould, Ecklund & Jackson, 1993; Gould, Finch & Jackson, 1993; Jackson, 1992; Scanlan, Ravizza & Stein, 1989; Scanlan, Stein & Ravizza, 1989, 1991). Interview techniques provide the opportunity for the open searching and probing necessary to explored new topics (Orlick & Partington, 1988), such as the development of facilitative interpretations of anxiety in this study. Specifically, in view of the fact that there are relatively few performers of this standard, interview techniques were considered the most appropriate method of enquiry because they provide the opportunity to accumulate as much quality information as possible on the research question. Furthermore, interviews allow the research team to understand and learn sport-specific terminology used by athletes. Also, from an organisational perspective, interviews can be scheduled at the performer's convenience, therefore increasing the likelihood of full participation and cooperation in the study. In an attempt to minimise interviewer effects while facilitating the gathering of qualitative data, an interview guide is typically adopted in the procedure. The use of a guide allows pertinent issues to be covered in an unstructured manner (Patton, 1980). Specifically, although the subjects can be asked the same questions in the same words, the presentation order of topics is free to develop with the flow of the interview.

Patton (1980) advised that when conducting interviews, probing rules need to be established prior to the session to ensure obtaining responses that are as consistent as possible in terms of both the depth and the complexity of the response. Before the interview, therefore, researchers decide on the number of general, elaboration and clarification probes to be used per response5.1

Research has reported that retrospective interviews are a viable method of obtaining information, especially when subjects were recalling salient experiences in their lives, such as major sporting events (Bloom, 1985; Lincoln & Guba, 1985; Wagenaar, 1986). However, to facilitate accurate recall of information that may have taken place a considerable amount of time previously, certain techniques are advocated to help the

5.1 More detail on the specific types of probes used in this study are provided in section 5.431.
correct recall of information. These include 'bounding' techniques to anchor subjects in
the correct time period which the interview is discussing.

Moss (1979), highlighted the need to include bounding techniques when asking
questions of the interviewee about past events. The technique involves clearly bounding
the time period that is being discussed in the interview by specifying the periods
beginning and end points. For example, the researcher may bound the time period
between the subject's ages of nineteen and twenty one for the purpose of the interview
discussion. Moss (1979) advised that this is most successful if it is established over two
separate sessions, such as bounding the time periods to be discussed in the initial contact
phase with the interviewee and reviewing the time periods at the time of the interview. To
additionally anchor the interviewee in the correct time period, Hindley (1979) and
Morton-Williams (1979) advised rebuilding the larger context in which the subjects lived
in the appropriate time period. Consequently, subjects can draw on all possible aspects of
their experience (e.g. people in their lives and other events during the period).

It should be highlighted that although these techniques were not developed
specifically for use in sport psychology research, Scanlan, Ravizza and Stein (1989), in
their examination of the careers of former elite figure skaters, were the first sport
psychology researchers to successfully adapted the techniques.

5.2.12 Qualitative Data Analysis

Henwood and Pidgeon (1995) stated that there is no one correct way to handle
qualitative material, and that the method chosen should be appropriate to the data itself,
and to the theoretical study question. The richness gained by using structured
retrospective interviews can be captured by a procedure referred to as 'content analysis'
of which inductive and deductive methods can be used. Specifically, inductive analysis
allows relationships and theories to emerge from the data (Patton, 1980). This method is
in contrast to the deductive content analysis which involves organising the quotes around
predetermined themes and categories. Glaser and Strauss (1967) referred to these
methods as 'grounded theory' approaches. Generating theory that is 'grounded' in
interviews, observations or textual material is an important principle of qualitative
research. The term is used to describe a method involving specific analytic strategies
formulated for dealing with and making sense of initially ill-structured qualitative data.
This approach is suitable for use with any form of unstructured material, and particularly
interview transcripts of participants' accounts.

Inductive content analysis5.2 has been the favoured method in the sport

5.2 Precise procedures used in this study are described in section 5.43
psychology literature. The procedures recommended by (Patton, 1980, 1990) have been successfully adapted to the sports of figure skating and wrestling by Tara Scanlan, Daniel Gould and their colleagues since 1989, yielding a wealth of information. Specifically, inductive content analysis involves analysing the content of verbatim transcripts of the subjects' accounts and is divided into a number of stages.

This procedure organises raw data into interpretable and meaningful themes and categories and begins with clustering the quotations around underlying uniformities (Glaser & Strauss, 1967). These underlying uniformities are the emergent raw data themes (the quotations). The clustering process, akin to conceptual factor analysis, involves comparing and contrasting quotations with other quotations in order to separate quotes with different meanings (Glaser & Strauss, 1967; Patton, 1980). Quotes vary, however, in descriptiveness due to the articulation level of the subject. When less description is involved, some themes do not neatly progress through all inductive levels but instead are carried directly to a higher inductive level.

The inductive process builds upon itself. The same comparing and contrasting procedures identify new, higher level (or order) themes. The analysis continues building upward until it is not possible to locate further underlying uniformities to create a higher level theme.

Each higher level theme becomes more analytic and interpretive requiring greater inference as the analysis moves conceptually upward from the quotes. In order to increase the credibility of the inductive results, consensus validation procedures are advised when conducting the analysis (Scanlan, Ravizza & Stein, 1989). Specifically, mutual agreement of researchers should be reached at all stages in the analysis before the next stage can progress.

The purpose of this section has been to briefly provide information on the qualitative interview techniques and data analysis procedures used in this study. As alluded to, a number of studies have adopted to use this method, and consequently the next section reviews and discusses these investigations.

5.22 RESEARCH LITERATURE

The empirical quantitative-based studies described in the previous two chapters, and Jones et al.'s (1993) study, support the notion that competitive anxiety is not necessarily debilitative, and that intensity and direction dimensions of multidimensional anxiety symptoms should be distinguished. The differences in the anxiety response between performers of high and lower levels of skill has also been described in the literature surrounding Study I. To restate, although the findings from these studies are far from consistent, performers with higher degrees of skill have been shown to cope
more efficiently with their competitive anxiety than performers with lower degrees of skill. The focus of this study examines the acquisition of facilitative interpretations of anxiety symptoms in elite performers; however, no research has directly addressed this question. Only Mahoney and Avener's (1977) study established, via follow-up qualitative interviews, that more successful performers perceived their anxiety as a stimulant towards performance. Very tenuous links with direction were uncovered in Gould et al.'s (1992a, 1992b) and Jackson's (1992) studies, previously discussed in Chapter 3 (section 3.221). Therefore, the focus of the literature in this chapter will be on other recent investigations that have examined very elite populations via the use of retrospective interview techniques and inductive analytic procedures. It should be highlighted that all of the studies under review are extensive in nature, and reveal a vast number of interesting results. However, only findings relating to the study of stress and anxiety, pressure, or positive/negative pre-competition affect will be discussed in the following sections.

5.221 Retrospective Interview and Inductive Content Analysis Studies

A number of studies have been carried out in recent years examining elite performers via the use of qualitative retrospective interviews (Gould et al., 1992a, 1992b, 1993a, 1993b; Gould, Eklund & Jackson, 1993; Gould, Finch & Jackson, 1993; Jackson, 1992; Scanlan, Ravizza & Stein, 1989; Scanlan et al., 1989, 1991). These studies have investigated sources of stress and enjoyment, coping strategies and experiences of actually being an elite performer in the sports of figure skating and wrestling. Firstly, Scanlan and associates (Scanlan, Ravizza & Stein, 1989, Scanlan et al., 1989, 1991) reported in a series of three articles, findings from twenty six former elite figure skaters, with the aim of identifying sources of enjoyment, and sources of stress during the most competitive phases of the skaters careers. The inductive analysis revealed that five major sources of stress emerged from the interview transcripts. These included firstly, 'Negative Aspects Of Competition', incorporating factors such as worries about the competition, thoughts of failure, overcoming competitive hurdles such as performing a weak event, and the importance of the competition. The second major source of stress was categorised as 'Negative Significant-Other Relationships' including interpersonal conflicts, performance expectations such as striving to meet other's expectations and criticisms by important individuals involved in the sport. The demands or costs of skating emerged as the third major source, including factors such as financial and time demands such as missing out on social events due to training. 'Personal Struggles', including physical or mental difficulties, self-doubts, perfectionism and dealing with homosexuality, emerged as the fourth source. The last major source of stress related to traumatic experiences such as having an unsettled home life, and fear of dying, referring
to the 1961 plane crash that killed all of the American Figure Skating Team. The authors concluded that these elite individuals therefore experienced stress from both competition and non-competition related sources.

Gould and colleagues have conducted an extensive amount of research using this method with both wrestlers and figure skaters. Discussing firstly, the wrestling sample, the lead two articles in the series investigated the mental preparation, cognition and affect (Gould et al., 1992a), and the thoughts occurring during competition (Gould et al., 1992b) have been previously discussed in Study 1 (section 3.221). The third article in the series examined the coping strategies adopted by these wrestlers at the Olympic games (Gould, Ecklund & Jackson, 1993). The inductive analysis of the coping strategies revealed that 39 raw data themes were extracted from the interview transcripts. These were abstracted into 11 higher-order themes and four general dimensions. The first dimension was labelled 'Thought Control Strategies' and included references to the athletes imposing constraint on their thought content, such as blocking distractions or using rational self-statements. The second dimension of 'Task Focused Strategies' included referrals to concentrating on goals and attending to a more immediate focus such as focusing on the match in hand. 'Emotional Control Strategies' emerged as the third dimension and incorporated arousal control strategies such as relaxation and pre-match emotional control and using visualisation techniques. Lastly, 'Behavioural Based Strategies' emerged from the interview transcripts and included references to controlling the environment such as separating themselves from other people or distracting themselves with other activities and the adherence to a set routine. These results indicated that coping efforts of the performers were not limited to certain individual coping skills but included combining the different strategies together in order to form an effective coping response.

Following the interviews with the wrestlers Gould and associates continued this line of investigation examining sources of stress, coping strategies and experiences of seventeen National Champion Figure Skaters who held their titles between 1985 and 1990 (Gould et al., 1993a, 1993b; Gould, Finch & Jackson, 1993).

The first article in the series examined the sources of stress, and established that the majority of the skaters experienced more stress after winning the title than before. In general, the findings from this study supported the sources reported by Scanlan et al. (1991), although some differences were evident. Most notably, a dimension labelled 'Competitive Anxiety and Doubts' emerged from the interview transcripts. This dimension included referrals to feelings of being scared prior to performance, of nervousness and anxiety at the competition, and concerns over individual capacities to handle competition pressure. Following this article, the coping strategies used by these skaters were reported by Gould, Finch and Jackson (1993). Many strategies were evident
in the transcripts; however, one of the most poignant related to pre-competition mental preparation and anxiety management. Within this category strategies such as pre-competition rituals and physical relaxation strategies were implemented to cope with the stress. Interestingly, in the context of this study, the skaters acknowledged that they were nervous and realised that this affects everyone equally. Furthermore, they reported that they tried to use the nervous energy in a positive way and face the anxieties head on. The authors concluded from the findings that the strategies the skaters adopted depended very much on the specific stressor that was experienced.

In the third article in the series Gould et al. (1993b) examined the positive and negative aspects of being a national champion athlete. From the interviews emerged some interesting findings relating to the pressure these skaters felt when they achieved the national championship. Specifically, pressures from being the 'top dog' in the sport such as having everything to lose and nothing to gain. Also, continually having to produce better performances, and failing to defend the title in the next championships were reported as sources of pressure. Furthermore, due to the accumulating stress of being the champion, motivation levels suffered leading to burnout. The recommendations for attaining and maintaining the title included factors such as not being frightened to grow and take risks, trying to avoid having to be perfect and making good use of social support.

Collectively, these studies have generally demonstrated the validity and wealth of information that can be generated via the use of retrospective interview techniques, complemented by inductive analysis methods. Although the majority of the research has addressed the specific populations of wrestlers and figure skaters, the methodology employed provides excellent guidance and encouraging avenues for future qualitative research into elite level performers in different sports.

5.3 STUDY 3: PURPOSE OF THE STUDY

Study 1 in this thesis highlighted that pre-competition anxiety symptoms are interpreted differently by performers who compete at different competitive standards. Specifically, elite performers interpret pre-competition symptoms as more facilitative towards performance than non-elite performers. However, the processes and mechanisms via which these elite swimmers have acquired the ability to interpret their anxiety symptoms as facilitative has not been addressed. Therefore, the purpose of the study was to examine how current elite male competitive swimmers have acquired the cognitive skills and strategies which enable them to interpret their pre-race thoughts and feelings as being facilitative. How do these performers make the butterflies they experience prior to
being facilitative. How do these performers make the butterflies they experience prior to competition fly in formation and work positively for their performance? (see Figure 5.1). Due to the exploratory nature of this study, no hypotheses were generated for this study.

Figure 5.1 Butterflies Flying in Formation

5.4 METHOD

5.4.1 SUBJECT SELECTION CRITERIA

Thirteen potential subjects were contacted either by letter, telephone or face-to-face, informed in detail of the nature of the study, and invited to participate. The researcher emphasised in the initial contact phase, that all information would be kept confidential and no individual person would be identified in publications or presentations. In order to address the research question, the elite level performers to be interviewed needed to fulfil the requirement of interpreting both pre-competitive cognitive and somatic anxiety symptoms as facilitative towards their upcoming races. In order to ensure that the elite performers were clearly facilitative in their interpretations, a two-step procedure was implemented prior to requesting participation in the full interview. Firstly, the subjects completed a modified trait version of the CSAI-2 (see section 3.4.21). Specifically, the test instructions were modified by Albrecht and Feltz (1987), so that each item is answered in terms of how the individual usually feels, to create a dispositional or trait measure named the Competitive Trait Anxiety Inventory-2 (CTAI-2). The results of the modified CTAI-2 from the potential subjects are presented in Table 5.1. Specifically, subjects 1-10 reported facilitative interpretations of both cognitive and somatic anxiety, but subjects 11-13 reported a combination of facilitative and debilitating anxiety perceptions. Following completion of the CTAI-2, a brief
discussion of the results of the questionnaire was conducted to ensure that the inventory was interpreted correctly and the subjects did indeed hold facilitative interpretations of their anxiety symptoms.

Table 5.1 Modified CTAI-2 Raw Scores for Potential Subjects

<table>
<thead>
<tr>
<th>Subject</th>
<th>Intensity Scores</th>
<th>Direction Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CAI</td>
<td>SAI</td>
</tr>
<tr>
<td>1</td>
<td>19</td>
<td>22</td>
</tr>
<tr>
<td>2</td>
<td>18</td>
<td>23</td>
</tr>
<tr>
<td>3</td>
<td>25</td>
<td>23</td>
</tr>
<tr>
<td>4</td>
<td>19</td>
<td>18</td>
</tr>
<tr>
<td>5</td>
<td>19</td>
<td>20</td>
</tr>
<tr>
<td>6</td>
<td>21</td>
<td>18</td>
</tr>
<tr>
<td>7</td>
<td>17</td>
<td>21</td>
</tr>
<tr>
<td>8</td>
<td>22</td>
<td>20</td>
</tr>
<tr>
<td>9</td>
<td>25</td>
<td>23</td>
</tr>
<tr>
<td>10</td>
<td>19</td>
<td>18</td>
</tr>
<tr>
<td>11</td>
<td>25</td>
<td>20</td>
</tr>
<tr>
<td>12</td>
<td>21</td>
<td>25</td>
</tr>
<tr>
<td>13</td>
<td>19</td>
<td>19</td>
</tr>
</tbody>
</table>

Of the thirteen swimmers originally targeted for the study; however, only the ten individuals with clear degrees of facilitation on both scales were asked to take part in the full interview. The modified CTAI-2 is illustrated in Appendix 13.

5.4.11 Subjects

The subjects who met these criteria consisted of ten current male swimmers who ranged in age from 19 to 27 years (mean age 22 years, SD=3.13). On average the swimmers had 9.2 years of national standard experience, and of these ten participants, three had won gold or silver medals at major championships (Olympic Games, European Championships and Commonwealth Games). All participants had competed internationally and were ranked in the country's top ten senior swimmers in their respective events at the time of the study.
5.42 THE INTERVIEW

5.421 Instrumentation

In order to efficiently address the research question and facilitate the interview process two separate instruments were developed; the 'Involvement Progression Questionnaire' and the 'Interview Guide'.

5.4211 Involvement Progression Questionnaire

To understand the development and commitment of the elite competitive swimmers, a swimming-specific involvement progression questionnaire was developed (see Appendix 14). This questionnaire was based closely on Bloom's (1985) seminal work. This research investigated talented individuals in the areas of science, art and sport, and concluded that to become accomplished in these fields was a long and arduous process. Bloom (1985) found that these individuals progressed through three phases (early, middle and later years) when commitment and dedication gradually increased throughout. This progression was successfully adapted to sport by Scanlan, Ravizza and Stein's (1989) figure skating study. Therefore, the progression, subdivided into three phases, enabled each participant's career to be tracked from initial exposure to swimming up to the present day when the interview was conducted. The involvement progression was discussed during the initial contact with the participants and completed prior to the interview. The characteristics of each of the three phases was described to each separate swimmer who then completed the questionnaire with this information in mind. Phase One centred around initial exposure to the sport, and is characterised by the participants taking part in group lessons, and usually swimming once per week in addition to taking part in other activities. Phase Two is characterised by a greater commitment to swimming. Other activities were put aside to a certain degree, and the swimmers became more serious about the sport as they started to race at competitive events. The main focus of the interview concerned Phase Three in view of the fact that this period is when the swimmers had the greatest level of commitment to the sport and competed at the highest standards, including major championships. Complete dedication to swimming is the central characteristic of this phase, the swimmers in this study training upwards of 25 hours per week in the water. Table 5.2. illustrates the descriptive data for the sample resulting from completion of the Involvement Progression Questionnaire and reports the amount of time spent in each phase with details of the quantity of training conducted in Phase 3.
Table 5.2 Descriptive Background Information for the Sample

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Age</td>
<td>22.0</td>
<td>3.13</td>
<td>19-28</td>
</tr>
<tr>
<td>Age Began Swimming</td>
<td>4.3</td>
<td>1.42</td>
<td>2-7</td>
</tr>
<tr>
<td>Years at Each Phase</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phase 1</td>
<td>3.8</td>
<td>1.93</td>
<td>2-7</td>
</tr>
<tr>
<td>Phase 2</td>
<td>4.2</td>
<td>1.40</td>
<td>2-6</td>
</tr>
<tr>
<td>Phase 3</td>
<td>8.6</td>
<td>2.27</td>
<td>5-12</td>
</tr>
<tr>
<td>Time Spent Swimming During Phase 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hours Per day</td>
<td>2.9</td>
<td>0.88</td>
<td>2-4</td>
</tr>
<tr>
<td>Days Per Week</td>
<td>6.2</td>
<td>0.63</td>
<td>5-7</td>
</tr>
<tr>
<td>Weeks Per Year</td>
<td>46.6</td>
<td>1.65</td>
<td>46-50</td>
</tr>
<tr>
<td>Times Competed at Nationals</td>
<td>9.2</td>
<td>3.46</td>
<td>5-16</td>
</tr>
</tbody>
</table>

5.42.12 Interview Guide

The findings from the quantitative-based studies investigating directional interpretations were used to provide a rationale and stimulus for many of the questions in the interview guide. Also, methodological guidance and advice was received from researchers who had conducted extensive interviews with elite performers.

The interview guide was pilot-tested on ten individuals who were swimmers competing nationally and the guide was refined with minor changes before it was used in the scheduled interviews. The pilot studies also allowed the interviewer to practise and refine interview techniques and skills. The complete interview guide is presented in Appendix 15.

5.43 PROCEDURE

Prior to the scheduled interview, the participants completed the 'Involvement Progression Questionnaire' which was returned and reviewed at the time the interview took place. Any questions regarding the study were answered and a date for the full
interview was agreed. All ten swimmers who were clearly facilitative agreed to participate and cooperate fully with the study.

5.431 The Scheduled Interview

A standardised format was used for the full interview schedule. Each participant was taken through an identical set of questions, asked the questions in the same way. The presentation of topics was free to vary with the flow of the interview, with pertinent issues thought important by the interviewee being developed where relevant. A-priori probing rules, including clarification ("I'm not sure I understand exactly what you mean, would you please go over that again"); elaboration ("Could you please explain further how you felt" etc.); and general probes (e.g., "Were there any other thoughts and feelings that you experienced") were established prior to the interview to obtain responses that were as consistent as possible in terms of depth and complexity (Patton, 1980).

All interviews were conducted by the same author providing a constant across the interviews. The interviewer was a competitive swimmer who had an extensive background in the sport and was accepted and well known in the swimming community. Consequently, the interviewer was familiar with the experiences of competitive swimming, the sport terminology and circumstances.

The interview was divided into a number of interrelated sections that progressed through the swimmers' careers from initial involvement in the sport up to the present day. This progression was based on their completed Involvement Progression Questionnaire which was used as a guide throughout the interview. The subjects were asked to constantly try to keep their perspective in the phase of the interview that was being discussed.

The interview was divided into six interrelated sections that progressed through the swimmers' careers. Section One consisted of introductory comments prior to the start of the recorded interview, and explained the use of the data, reasons for taping the session, issues of confidentiality, the rights of the interviewee, and briefly the issues to be perused in the interview. Importantly, two orienting instructions were then provided that were reinforced at appropriate times throughout the interview. Firstly, questions would be asked not only about competing at the present time but also in the past when they may not have been at an elite standard. If the subjects had difficulty in recalling information, they were asked to take their time, and if they still could not remember, to tell the interviewer, rather than guess. The second orienting instruction explained that the subjects could draw upon all aspects of their swimming career in an attempt to try to create an overall experience. Therefore, experiences in an out of the pool context that
were related to their swimming experiences could be drawn upon. Finally, any questions that the subjects raised were answered before the interview was formally started.

Section Two discussed Phase One on the Involvement Progression Questionnaire and discussed the subjects' early experiences as swimmers. This was designed to facilitate recall and retrospection with the aim of getting the participants to talk descriptively. Based on the recommendations of Scanlan, Ravizza and Stein (1989), 'bounding' techniques were used to anchor the participants in this phase by clearly defining the beginning and end points of the phase.

Section Three addressed issues related to when the swimmers commitment level in the sport increased (Phase Two), and asked questions about their first competitive experiences. This was the first section to address how the swimmers felt prior to racing and their interpretation of these thoughts and feelings.

Section Four discussed the main section of the interview (Phase Three), when the subjects were fully committed to competitive swimming and addressed issues pertaining to the interpretation of pre-race symptoms in more depth. This progressed from when the swimmers competed as junior and senior internationals, and up to the present day.

Section Five asked the swimmers for any advice they may wish to offer less experienced performers in order to develop facilitative pre-race interpretations. Finally, Section Six concluded the interview with questions relating to how the subjects perceived the interview experience, if they felt their responses had been lead by the researcher, and any further comments that they wished to make.

All ten interviews were conducted face-to-face, and were generally conducted away from the competitive swimming environment. The interviews lasted approximately 60 minutes, were tape-recorded in their entirety and transcribed verbatim yielding over 200 typed pages. Two complete interview transcriptions are presented in Appendix 16a and 16b.

5.4.3.2 Interviewer Bias

The potential for bias in the interviews was addressed in several ways: Firstly, the interview guide structured the session and ensured all topics were treated in a standard way and in a particular order.

5.3 As alluded to in section 5.2.11 bounding is most successful if established over two sessions. Consequently this process began during the initial contact phase with the subjects when they completed the involvement progression questionnaire in advance of the scheduled interview.

5.4 Rychta (1982) found athletes involved in high level sport tended to be independent minded. Werther-Bales (1985) found that athletes ranked in the top 6 in the world expressed their views in a self-directed manner, and appeared to be almost immune to interviewer bias.
Secondly, all interviews were conducted by the same person, who strove to adopt a neutral, impartial stance to avoid bias. Furthermore, a second researcher who was an experienced interviewer monitored the pilot sessions as a control measure and provided constructive feedback. The pilot interviewee also provided extensive feedback when asked: "how the interview went"; "did you feel you could tell your story fully?", and "did I lead your responses in any way?". These pilot participants expressed that they were in no way influenced by the interviewer. The subjects were also encouraged to insist on making sure the interviewer clearly understood their perspective, for example, to inform when necessary, "no, it wasn't quite like that, let me explain further". Also, copies of the transcripts were sent randomly to certain subjects for verification of their accounts as a true reflection of their story. Lastly, the individual biases of the investigators were controlled by using a three person consensual validation procedure for the data. Specifically, each stage of the analysis of the transcripts had to be discussed until agreement was reached.

5.44 DATA ANALYSIS

Inductive content analysis, as recommended by Patton (1980) and successfully adapted to sport by Scanlan, Gould and their colleagues, was adopted in this study. Content analysis is a procedure which organises raw data into interpretable and meaningful themes and categories, and allows the themes and categories to emerge from the quotations (Patton, 1980). Specifically, the process begins with clustering quotes around common threads which become the emergent themes. The analysis continues to develop until it is not possible to locate further common threads to create a higher level theme. The specific procedure adopted in this study incorporated a seven-step procedure illustrated in Figure 5.2.

5.5 RESULTS

The interviews were analysed using inductive content analysis. The results derived from the use of these procedures are presented by simultaneously examining the responses from all ten swimmers. Additionally, the number of subjects providing raw data themes that fell into the higher order themes and dimensions can be observed in Table 5.3. Specifically, 107 raw data themes emerged from the interview transcripts. These were abstracted into 18 higher order themes and 4 general dimensions.

The findings showed that these swimmers did have negative experiences when they started out in the sport (Dimension 1) but they learned at a young age that nerves can be positive (Dimension 2). Thirdly, as they developed, and up to the present day they use
a pre-competition routine (Dimension 3) and lastly follow a refined pre-race routine (Dimension 4).

**Figure 5.2 Data Analysis Procedures**

1. Transcripts read and re-read by author to ensure familiarity with content.
2. Raw data themes, i.e., quotes/paraphrased quotes, identified from the transcripts. Transcripts were then re-read to ensure all raw quotations made intuitive sense to author.
3. Raw data themes compiled in list form from all individual participants across all subjects.
4. Inductive content analysis conducted to identify common themes from lists of subsectioned raw data. Second level themes labelled as "higher-order themes". Highest level themes (those of greatest abstraction) were labelled as "general dimensions".
5. Deductive analysis conducted to provide a validity check in verifying all themes and dimensions present in transcripts.
6. Number of citations in each dimension and theme calculated for frequency analysis.
7. Individual biases of author controlled via a consensual validation procedure.
### Table 5.3  Number of Swimmers Providing Raw Data Themes Falling Into Major Categories

<table>
<thead>
<tr>
<th>Dimension/ Higher Order Theme</th>
<th>No. of Citations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Early Unwanted Negative Experiences</td>
<td>10</td>
</tr>
<tr>
<td>Negative Competition Cognitions</td>
<td>8</td>
</tr>
<tr>
<td>Negative Somatic Feeling States</td>
<td>7</td>
</tr>
<tr>
<td>2 Learned at Young Age Nerves Can be Positive</td>
<td>10</td>
</tr>
<tr>
<td>Accept Feelings</td>
<td>10</td>
</tr>
<tr>
<td>Require Feelings</td>
<td>4</td>
</tr>
<tr>
<td>External Persuasion</td>
<td>5</td>
</tr>
<tr>
<td>Early Race Preparation</td>
<td>10</td>
</tr>
<tr>
<td>Positive Cognitive Labelling</td>
<td>6</td>
</tr>
<tr>
<td>3 Pre-Competition Routine</td>
<td>10</td>
</tr>
<tr>
<td>Mental Imagery</td>
<td>10</td>
</tr>
<tr>
<td>Goal Setting</td>
<td>10</td>
</tr>
<tr>
<td>4 Pre-Race Routine</td>
<td>10</td>
</tr>
<tr>
<td>Rationalisation</td>
<td>10</td>
</tr>
<tr>
<td>Thought &amp; Feeling Control</td>
<td>9</td>
</tr>
<tr>
<td>Dissociation Tactics</td>
<td>6</td>
</tr>
<tr>
<td>Cognitive Denial</td>
<td>4</td>
</tr>
<tr>
<td>Internal Focusing</td>
<td>8</td>
</tr>
<tr>
<td>External Focusing</td>
<td>3</td>
</tr>
<tr>
<td>Positive Imagery</td>
<td>7</td>
</tr>
<tr>
<td>Physical Strategies</td>
<td>10</td>
</tr>
<tr>
<td>Relaxation Strategies</td>
<td>5</td>
</tr>
</tbody>
</table>

Therefore, Dimensions 1 and 2 focus around competition when the swimmers were younger (approximately up to age 15), whereas Dimensions 3 and 4 focus around procedures practised, refined and followed in the more experienced years.

The four general dimensions and associated higher order themes are represented hierarchically in Figures 5.3, 5.4, 5.5 and 5.6. Representative quotations from the transcripts are interspersed amid the results to clarify and illustrate the analysis points.
5.51 Early Unwanted Negative Experiences - Inductive Content Analysis

As can be seen in Figure 5.3, a total of 13 raw data themes concerning the undesired negative thoughts and feelings that the swimmers experienced when they were young were extracted from the interview transcripts. Subsequently, these raw data themes were organised into two higher order sub-themes, two higher order themes and further abstracted into one dimension labelled 'Early Unwanted Negative Experiences' which were reflected in 100% of the transcripts. The higher order themes from which this dimension arose were: (a) 'Negative Competition Cognitions and (b) 'Negative Somatic Feeling States. 'Negative Competition Cognitions', cited by 80% of the subjects, included swimmers' references to competition and preparation concerns. Examples of these thoughts were reflected in the following comments: "I just started to wonder if I had done the right amount of training, whether I had trained hard enough, and I would have flashes of doubts about this." And, "I was always worried about letting the team down. I wanted to do well and win my own race but that was to get good points for the team." Specifically, typical worries centred around the competition itself included fears of finishing last in the race, worries about making mistakes such as not touching the wall during the race, and even diving incorrectly.

Seventy percent of the swimmers made reference to descriptors of common physical discomfort, which emanated from the second higher order theme of 'Negative Somatic Feeling States'. These included such references as feeling sick when at the venue of the competition, feeling tired before the upcoming race being in a state when the swimmer was constantly fidgeting. Here is how one swimmer expressed how he felt before the race: "Every single time I was stood behind the blocks ready to swim I would get really bad pins and needles in my hands and fingers, I didn't like it at all."

5.52 Learned at Early Age Nerves Can be Positive - Inductive Content Analysis

This dimension was interpreted from a total of 18 raw data themes present in 100% of the interview transcripts reporting that nerves can be interpreted positively in the younger years (Figure 5.4). These raw data themes were organised into five higher order themes, of which one 'Early Race Preparation Facilitation' contained complementary higher order sub-themes.

Progressing through the higher order themes in sequence, all ten swimmers expressed that they accepted their pre-race symptoms even though they were relatively inexperienced. As two swimmers commented: "I just took the attitude that there is no point in worrying about it now, because there is nothing you can do about it, it's too late....you just have to get on with it." And, "I mean they were natural feelings....I just expected them to be there....I would probably worry if they weren't"
Figure 5.3 Early Unwanted Negative Experiences - Inductive Content Analysis

<table>
<thead>
<tr>
<th>Raw Data Themes</th>
<th>Higher Order Sub-Themes</th>
<th>Higher Order Themes</th>
<th>Dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fear of coming last</td>
<td>Worried about making mistakes</td>
<td>Worried about swimming correct number of lengths</td>
<td>Worried about performing poorly</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Worried about bottling under pressure</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Worried about letting team down</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Scared of racing</td>
</tr>
</tbody>
</table>

Doubts if trained enough

Feeling sick at the pool
Felt tired before the race
Funny feeling in my head
Pins & needles in hands
Constantly fidgeting

Experiencing Competition Worries

Negative Competition Cognitions

Early Unwanted Negative Experiences

Experiencing Preparation Worries

Negative Somatic Feeling States
Learned at Young Age Nerves can be Positive

Grew to take them as a good thing
Learned they would be positive for performance
Could feel that way, never reduced them
Learned to accept symptoms as necessary
Discovered that’s what happens when you race
Realised & expected symptoms to be there
Found they were natural feelings
Found I enjoyed the symptoms

Early Aiding of Performance
Raed nerves increased my concentration
Learned how to use symptoms to my advantage & go faster
Discovered nerves were necessary to swim well
Original goal was nerves

Told nerves bring out the best in you
Advised nerves necessary to perform well

Early Aiding of Mental Preparation

Required aEarly Age
Cognitive Labelling of Symptoms as Positive

Required aEarly Age

Learned at Early Age Nerves Can be Positive Inductive Content Analysis

Grew to accept I had to feel that way, never reduced them
Learned to accept symptoms as necessary
Discovered that’s what happens when you race
Realised & expected symptoms to be there
Found they were natural feelings

Early Aiding of Pre-Race Preparation Facilitation
Accepted as necessary

Acceptance of Pre-Race Symptoms at Early Age

Early Aiding of Mental Preparation

Learned to accept symptoms as necessary
Discovered that’s what happens when you race
Realised & expected symptoms to be there
Found they were natural feelings

Early Aiding of Mental Preparation

Learned at Early Age Nerves can be Positive
Interestingly, 40% of the swimmers mentioned that they also required the symptoms, claiming they wanted to feel the way they did, and were more concerned if the feelings were not present prior to the race. They reported that the presence of these symptoms therefore acted as an indication of readiness to race. An example relating to the requirement of nerves was:

"I mean you have to get nervous to swim well....If you're not bothered about it, if you're not nervous you're not going to swim well....I think the nerves bring out the best in you, and I soon realised that I wanted to feel this way".

Persuasion via significant others, cited in half of the transcripts, emerged as the primary method of educating the swimmers of the positive properties of their symptoms in the early years. The swimmers were told by three different individuals involved in the sport that nervous feelings can bring out the best in you and are necessary to perform well. These included the swimmers own coaches, older more experienced swimmers and their parents. A raw data theme abstracted into the dimension was reflected in sentiments such as the following:

"I remember my first reasonably big meet; it was a diddy league final. I was driving there with my dad and I said I was nervous, I said I had butterflies in my stomach. He said that's a really good thing because that will get the adrenaline flowing. Obviously when your young you haven't got any idea what adrenaline is, and he said it was a good thing so I took it as read that it was a good thing....I was feeling this thing in my stomach, but it was a good thing so I took his word for it".

The higher order theme of Early Race Preparation Facilitation, reflected in 100% of the transcribed accounts, contained two supplementary sub-themes. Firstly, 'Early Aiding of performance, included references to the discovery of needing to worry to swim well and the realisation that the performer would swim faster if he was nervous prior to the race. Two swimmers indicated:

"Although I had the butterflies in my stomach just like every other kid, I realised that whenever I did and whenever the greater the occasion, I always seemed to swim faster".

"I learned to use the symptoms to my advantage....I used them to make myself go quicker....It wouldn't have been the same without them".

These findings were complemented by the swimmers reporting that when they were in a nervous state they were able to concentrate more on the upcoming race,
subsequently facilitating their psych-up strategies. One swimmer spoke of the increase in concentration as a result of his pre-race symptoms:

"I discovered the symptoms helped me psych-up for races. If you knew the nerves were there the adrenaline would flow and make me perform better....concentrate harder, they (the symptoms) would make me concentrate on the race....help me prepare to swim fast....to get off the blocks quickly, get in the pool and swim fast".

'Cognitive Labelling of Symptoms as Positive' emerged as the final higher order theme, and was referenced by 60% of the swimmers. Within this dimension, the swimmers stated how they learned that feeling nervous would be a form of "positive anxiety" as a number swimmers reported. They developed to interpret the symptoms as a good thing and something that they enjoyed. For example, one swimmer expressed:

"I found that the more I raced the more I enjoyed it. What I mean is that I started to look forward to Saturday's when I would be racing. I liked feeling nervous once I got used to it. It gave me a buzz, especially at a bigger meet, swimming just wouldn't have been the same without them (the symptoms)".

5.53 Pre-Competition Routine - Inductive Content Analysis

Figure 5.5 illustrates a total of 12 raw data themes concerning the 'Pre-Competition Routine' that the swimmers developed over time, and now tend to follow. Subsequently, these raw data themes were organised into seven higher order sub-themes and two higher order themes. It is important to highlight, that these are strategies that the swimmers adopt prior to the day(s) of the actual competition, and therefore, the temporal patterning is relatively broad (i.e. from annual goals being set, to imagery one week in advance of the competition).

Mental imagery strategies were reported by all of the swimmers and emerged as the first higher order theme in the analysis. This was further abstracted into two sub-themes illustrating training and skill practice imagery. As part of the training imagery that the swimmers followed, they utilised a very specific form of imagery while actually training in the water therefore simulating the environment closely. Interestingly, one swimmer expressed how he was unable to visualise his entire race initially, but that the event in his mind becomes complete and clear as the major championship approaches:

"As I get closer and closer to the event or closer to race day, so my event seems to pan out. It becomes a lot more clear, and where as it might have been just the first fifty, it establishes itself into a full two hundred breaststroke with stroke count, feel of the event, adrenaline surge, and I see myself doing the whole event and achieving exactly what I want to achieve".
Figure 5.5  Pre-Competition Routine-Inductive Content Analysis

<table>
<thead>
<tr>
<th>Raw Data Themes</th>
<th>Higher Order Sub-Themes</th>
<th>Higher Order Themes</th>
<th>Dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visualise the race in training</td>
<td></td>
<td>Training Imagery</td>
<td></td>
</tr>
<tr>
<td>Event pans out in visualisation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>as the race gets closer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Imagery a week in advance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>making sure I know what to do</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Imagery to practise skills</td>
<td>Skill Practise Imagery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goals for every training session</td>
<td>Daily Goals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Focus on yearly goals using split times</td>
<td>Annual Goals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Focus on yearly goals for training &amp; competition</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Set process goals for future races</td>
<td>Process Goals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use previous split times</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Set performance goals</td>
<td>Performance Goals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use performance goals to achieve position</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Set outcome goals</td>
<td>Outcome Goals</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The swimmers also reported that they used this psychological skill to prepare for the competition by making sure they knew what they wanted to do not only at the venue of the competition but also in the race itself.

Goal setting emerged at the second strategy that the participants adopted in the period prior to the competition and was also referred to by 100% of the subjects. These strategies were comprehensive and extremely detailed, the participants reporting that they spent a considerable amount of time planning with their coaches, their goals for training and competition. These programmes were typically initiated by establishing yearly annual goals based on the performance times achieved in the previous years' competitive performances. Daily goals for each training session were also set and the swimmers reported adopting the use of process goals as a means of achieving performance times and subsequently outcomes positions. Quotations relating to the swimmers' goal setting programmes included:

"The first thing we do is set out the entire year, training volumes, training intensities and work out those in conjunction with the competitions that we know and the dates of those obviously. Then we sit down and discuss what we want from the year, what sort of times (performance goals) and what we want from each meet leading up to the major championship of the year".

"If someone was to say you can go 2.10, that's a fast time, I really don't know if I can do that, but if you break the race down into four individual one length swims then it becomes more believable....and you think that I have actually split that time before and I have actually come back (the last length) in that time, so what I have to do is find an improved split for the second length and it becomes more believable, and that's how I go about my goal setting".

5.54 Pre-Race Routine - Inductive Content Analysis

The general dimension labelled 'Pre-Race Routine' (Figure 5.6a, b, c & d) presents, a total of 64 raw data themes concerning the actual pre-race routine that the elite swimmers followed. These raw data themes were organised into 16 higher order sub-themes and nine higher order themes.

This was an extremely detailed content analysis containing a significant amount of rich information. The results of this dimension will therefore focus primarily on one higher order theme (Figure 5.6a) of 'Rationalisation of Thoughts and Feelings' as this most directly related to the central research question.

It should be highlighted that the subjects were asked in the interview about the mental skills that they use prior to competition and prior to the race with reference to maintaining facilitative interpretations of thoughts and feelings. One hundred percent of the swimmers expressed that these skills combined together as part of an overall mental preparation package that complemented maintaining facilitative interpretations.
Figure 5.6a  Pre-Race Routine-Inductive Content Analysis

<table>
<thead>
<tr>
<th>Raw Data Themes</th>
<th>Higher Order Sub-Themes</th>
<th>Higher Order Themes</th>
<th>Dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never worry about symptoms, just accept them</td>
<td>Accept Symptoms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accept that you can't avoid them</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I need nerves to illustrate race importance</td>
<td>Require Symptoms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Need a certain level of nerves to be there</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I like the feelings to be there</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Won't swim well if I'm not nervous</td>
<td>Use Nerves to Facilitate Performance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If the feelings aren't there</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I know it's not going to happen</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I know I have to be nervous to swim well</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I work the symptoms to my advantage for the race</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Symptoms are definitely a good thing</td>
<td>Positive Cognitive Labelling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>However I feel I perceive it positively</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceive symptoms in a positive light</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>
All the participants in this study reported how they rationalised their pre-race thoughts and feelings to themselves as part of their pre-race routine. These results very much mirrored and supported the higher order themes that emerged from the data regarding how the participants learned that nerves could be positive when they were developing and gaining experience in the sport. The main difference between these two dimensions related to how the skills were acquired. Specifically, when they were younger, they either learned and discovered for themselves, or were told by significant others the positive properties of experiencing the symptoms they felt before a race. Conversely, the quotations in this 'Pre-Race Routine' dimension are in the present, as to what they have learned to do and now adhere to. This skill of rationalisation has therefore been refined with the experience gained in the sport. Four sub-themes are evident in Figure 5.6a presenting how, firstly, pre-race thoughts and feelings are accepted. Themes abstracted into this dimension were reflected in sentiments such as the following by two of the swimmers:

"I just accept the symptoms, I accept that they are there....I have never tried to reduce them, certainly not...They have never got in the way".

"The way you feel before a big race is just something that you can't avoid. If you want to make it in this sport you have to accept the feelings and just get on with it....worrying about feeling sick or tense is just a waste of time".

Requirement of the symptoms was described as being very important for the upcoming race. For example, the swimmers spoke about how they need, and like, the nerves to be present because they signify the importance of the race, and the competition. The following provides an illustration of the type of comment expressed:

"If I didn't have those kind of feelings before a race I wouldn't feel that the race was important. I need them to get myself psyched up to perform well....I interpret them that they have to be there in order for me to swim well".

Following on from this, it is evident that the participants use these nerves in a facilitative manner towards their upcoming races. One champion swimmer illustrated this point relative to the delicate line he perceives between positive and negative states prior to the race:

"There is a very fine line between anxiety and excitement....and I think probably when I do my best performances I am very close to that line...I think I usually am in a pressure situation, very close to that line".

Another performer emphasised his intense desire to be very concerned about the upcoming race:
"I mean I have to worry...I have to be worried about the way I am going to swim...In my mind I need to be really worried to swim really well".

All of the participants in this study cognitively labelled their pre-race symptoms as very positive. Representative remarks reported that the way the swimmers felt before the race was "definitely a good thing," and perceived and interpreted in "a positive light." Unusually, but very interestingly, one swimmer expressed that however he was feeling he perceived that positively. Specifically he expressed:

"I've learnt now, however, I feel it's a good thing...If I'm at a meet and I'm not nervous and it's quite an important meet I will say 'good I'm not nervous' and that works exactly the same if I am very nervous before the race....whatever I feel I try and perceive it positively".

Figures 5.6b, 5.6c and 5.6d, illustrate the other strategies that the swimmers use in the pre-race period, approximately 30-60 minutes prior to the race as part of an overall package that combine together which help maintain facilitative interpretations. These will be highlighted briefly with the relevant number of citations. Ninety percent of the swimmers in this study expressed a considerable amount of control over their thoughts and feelings via self-talk strategies, positive thinking and controlling cognitive activation and arousal (Figure 5.6b).

In this sub-theme the swimmers described how they decided for themselves the correct time to start thinking about the race and become activated for performance. Prior to this, 60% of the swimmers would dissociate by forgetting about the upcoming performance by talking to friends and family about anything but the upcoming race. Four of the swimmers expressed that they denied the importance of the race to help maintain a positive outlook. Examples of such related to walking about the poolside with a "don't give a damn" attitude or repeating to themselves that their upcoming race really is not that important.

Eighty percent of the swimmers reported using 'Internal Focusing' strategies, concentrating on factors that were very much within their control (Figure 5.6c). For example, focusing on the process goals they had set for the race, such as achieving a fast and dynamic start, also how many strokes they wanted to take during the race. The second sub-themes in 'Internal Focusing' included strategies to ignore opponents to focus on their own race such as listening to a walkman and concentrating on neutral factors such as the scoreboard or tunnel vision focusing down the lane they were about to compete in.
Figure 5.6b  Pre-Race Routine-Inductive Content Analysis

<table>
<thead>
<tr>
<th>Raw Data Themes</th>
<th>Higher Order Sub-Themes</th>
<th>Higher Order Themes</th>
<th>Dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Let myself get nervous at a certain time before the race</td>
<td>Cognitive Activation &amp; Arousal Control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avoid thinking about the race until just before the start</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turn on the concentration close to the start</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Build myself up rather than allow things to happen</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceive everything positively</td>
<td>Thought &amp; Feeling Control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Generally think positive</td>
<td>Positive Thinking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Think about good training done</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Think about previous good race performances</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive self-talk</td>
<td>Self-Talk</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tell myself to stay relaxed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do not think about the race</td>
<td>Dissociation Tactics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lie down &amp; forget about it</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sleep &amp; forget the race</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Talk to others but not about the race</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Walk about with a &quot;I don't give a damn&quot; attitude</td>
<td>Cognitive Denial of Race Importance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use the excuse that &quot;I'm younger &amp; have plenty of time&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kid myself that the race is not important</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Figure 5.6c  Pre-Race Routine-Inductive Content Analysis

<table>
<thead>
<tr>
<th>Raw Data Themes</th>
<th>Higher Order Sub-Themes</th>
<th>Higher Order Themes</th>
<th>Dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concentrate on the processes I want to achieve in the race</td>
<td>Concentrating on Race Process Goals</td>
<td>Internal Focusing</td>
<td></td>
</tr>
<tr>
<td>Concentrate on upcoming race goals</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concentrate on technique</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concentrate on turns</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concentrate on stroke count</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Focus on the lane</td>
<td>Race Focusing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Focus on the scoreboard</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Listen to walkman to shut things out &amp; help focus on the race</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ignore opponents &amp; focus on upcoming race</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Draw inspiration from the crowd atmosphere</td>
<td>Draw from External Stimuli</td>
<td>External Focusing</td>
<td></td>
</tr>
<tr>
<td>Watch others swim well</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psyco others out</td>
<td>Opponent Strategy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Picture myself in the lead</td>
<td>Positive Pre-Race Imagery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Imagine the feel &amp; power of the stroke</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visualise good race processes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Imagine every detail of the upcoming race</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Three of the swimmers chose also to use 'External Focusing' strategies, such as trying to psych-out the opposition and drawing inspiration not only from friends in the crowd but also the atmosphere of the audience. 'Positive Pre-Race Imagery' skills were cited in 70% of the transcripts and included the swimmers picturing themselves in the lead, and how powerful and efficient their stroke would feel once in the water and racing.

Not surprisingly 100% of the swimmers reported using certain 'Physical Strategies' (Figure 5.6d), in view of the fact that all elite athletes perform a routine physical warm-up prior to competing. Additionally, some of the swimmers in this study reported leaving the venue for a while and going off on their own, or attempting to make themselves more aggressive prior to the race. Finally, five of the swimmers did report using either a mental or physical relaxation strategy prior to their upcoming race. These included sleeping, using a walkman or stretching and controlled breathing techniques.

5.55 Advice For Others

Following the main sections of the interview, the swimmers were asked for any advice they should offer to swimmers who suffered from debilitative interpretations of their pre-competition anxiety symptoms. Different pieces of advice were offered including keeping the sport in perspective and not taking it too seriously and trying not to worry about opponents and therefore, concentrating solely on your won race. However, the swimmers offered one consistent piece of advice with regard to altering the perception of pre-race feelings from negative to positive. All of the performers in the sample explained how they would draw upon not only their own personal experiences of how they felt before a race, but also the experiences of other swimmers to try and help the performer understand the reason they felt the way they did. The specific advice focused around attempting to demonstrate how the thoughts and feelings prior to racing are a natural part of the sport and provide an indication that the swimmer is ready to compete. Two champion swimmers remarked: "I would try and explain to them that they need these sort of feelings to help them, as it means that they are concerned about the race". Also to reassure the swimmer by saying, "Don't worry, its only your body preparing to race". Furthermore, more extensive advice would centre around recounting individual experiences:

"I could always relate to certain occasions.....say like any other coach, that you need to be nervous, but excited but without that your not going to get the adrenaline surge and you need adrenaline to perform to your optimum".
Figure 5.6d  Pre-Race Routine Inductive Content Analysis

<table>
<thead>
<tr>
<th>Raw Data Themes</th>
<th>Higher Order Sub-Themes</th>
<th>Higher Order Themes</th>
<th>Dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Take myself away to somewhere cool</strong></td>
<td>Physical Removal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Go somewhere quiet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Go off on my own</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Flexibility to get in the right frame of mind</strong></td>
<td>Physical Warm-Up Routine</td>
<td>Physical Strategies</td>
<td></td>
</tr>
<tr>
<td>Follow similar warm up routines</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Generally warm up</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Start stretching</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warm up more</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Get physically aggressive</strong></td>
<td>Aggression Control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Make myself more aggressive</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Try &amp; stay as relaxed as possible</strong></td>
<td>Mental Relaxation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Just say &quot;relax&quot; to myself</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use a walkman to relax</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Towel over eyes to relax</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sleep to relax</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Stretch to relax myself</strong></td>
<td>Physical Relaxation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Controlled breathing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Snake breathing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lie down &amp; relax down my body</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5.6 DISCUSSION

The research question for this chapter emanated from the previous two studies in the thesis, that established support for distinguishing between intensity and direction dimensions of competitive anxiety, and for the notion that anxiety is not necessarily debilitative towards performance. Specifically, the purpose of this study was to examine how elite performers have acquired the ability that enables them to interpret their pre-competition anxiety as being facilitative for subsequent performance. This question was examined via the use of structured retrospective interview techniques and inductive content analysis procedures. The study was the first of its kind to examine the acquisition of facilitative interpretations from either a qualitative or quantitative perspective.

The findings indicate that the performers did not interpret pre-competition anxiety as facilitative towards performance from the first time they started competing. Interestingly, the swimmers experienced the same cognitive and somatic symptoms as all other swimmers when they were young. They typically worried about the training that they had done and if it was sufficient to compete well. Also, many worries emerged relating to actually performing in the race, such as cracking under pressure, letting the team down and making mistakes in front of the spectators. They also experienced somatic symptoms such as feeling sick and tired prior to competing. However, these mental and physical symptoms were not welcomed by these performers in the younger years; they were unwanted, not enjoyed and interpreted negatively towards the upcoming race.

However, as the swimmers developed and gained experience they learnt that the symptoms they were experiencing prior to competition could be positive and actually aid them in the race itself. This alteration in the way nerves were interpreted was the result of two primary influences. The first involved listening to significant others in their lives, and taking advice on the way they felt prior to a race. The swimmers' parents, coaches and older more experienced swimmers all played a part in this development. These important individuals explained the nerves they previously interpreted as negative were indeed necessary to perform to their best. Secondly, following the advice of these people, the swimmers then started to accept the way they were feeling as a necessary and natural part of competing. They reported that when they realised that the nerves were a good thing, they did not try to reduce the symptoms, but conversely, wanted them to be there, and indeed worried if prior to a race the symptoms were not present. The swimmers conveyed that they now enjoyed feeling nervous prior to a competition, and indeed looked forward to feeling this way. Furthermore, through these natural learning
experiences, they developed the ability to make use of pre-race nerves to aid performance and mental preparation.

As the swimmers developed and increased in standard, they developed and now follow refined pre-competition and pre-race routines. They highlighted that the skills they now use combine together to form a compete mental preparation package that facilitates the maintenance of interpreting pre-race symptoms as positive. The swimmers explained how all of the skills used fit together as a jigsaw, and that no one skill was more important than others. Specifically, the swimmers developed a Pre-Competition Routine which is practised and implemented prior to the competitive race. This routine involves the use of mental imagery and goal setting strategies. The swimmers reported how using imagery, for example, one week in advance to simulate the competition, maintains the facilitative interpretation of symptoms on the day via reducing uncertainty and doubt. This was mentally rehearsed previously, and provides the swimmer with the confidence of being completely prepared. Goal setting techniques were reported as being extremely important to this end. Specifically, the swimmers reported that the goals set provided a focus for each competitive race, in terms of the race outcome, performance times and the processes to be achieved in the races.

The swimmers provided a significant amount of detail about the Pre-Race Routine. However, in terms of the research question for this study, the most important aspect of this routine related to the rationalisation of thoughts and feelings before the race which was reported by all ten swimmers. As already stated, the swimmers interviewed conveyed that as young competitors they were told that nerves can be positive. They accepted this advice and started to interpret their pre-race states more positively. Now that the swimmers are more experienced, a similar pattern emerged from the findings. Specifically, the swimmers accept the way they feel, make use of pre-race nerves, and do not try and reduce symptoms. They explained how nervousness illustrates the importance of the race, and if symptoms are not present this indicates that a good performance is unlikely. Therefore, all of the swimmers went so far as to say that pre-race mental and physical symptoms are a positive factor for a good performance.

In summary, these findings illustrate that the acquisition of the mental skills was not straightforward, and involved gradual developmental stages. Specifically, it appears that the performers developed facilitative interpretations by taking advice from more experienced individuals, and secondly, via the natural learning experiences such as racing at different competitive standards, at home and abroad and against different opponents.

It is interesting to also note that when the swimmers were asked for a few words of advice to help performers who suffer from debilitating interpretations of their anxiety symptoms, the responses were extremely consistent. All ten swimmers suggested that
they would recall their own and others’ experiences and try and explain why thoughts and feelings are experienced prior to a race. Therefore, it would appear essential that young performers suffering from debilitative interpretations of their anxiety are told why they feel the way they do in pressure situations. Furthermore, the straightforward remarks of one swimmer’s father on the way to a competition, explained that it was good to feel nervous, was enough to convince him that nerves were positive. Interestingly, this one competitive swimmer went on to achieve a Commonwealth Record and Gold Medal. It was evident from the interviews, that these skills have been developed over the years, have been refined and extensively practised, and although there was close agreement between the swimmers on the strategies, individual differences were also prominent in how these skills were acquired. Indeed, by the nature of the qualitative methodology employed in the study it was not surprising that unique and individual responses were generated, in that, the themes and dimensions in the inductive analysis were allowed to actually emerge from the transcripts.

The findings from this study are generally consistent with other qualitative research on elite athletes (Gould et al., 1992a, Gould, Finch & Jackson, 1993; Orlick & Partington, 1988) concerning the adoption of refined pre-competition plans that performers closely and consistently adhere to. Specifically, the elite swimmers mentally prepared for training, developed intelligent goal setting techniques and imagery skills and developed refined and practised pre-competition and race plans. Furthermore, the study findings highlight that the swimmers use these skills as part of an overall mental preparation package which they perceive as contributing significantly towards maintaining facilitative interpretations of their pre-race thoughts and feelings. Interestingly, Gould, Finch and Jackson's (1993) study on elite figure skaters reported the use of thought control strategies prior to competing, including rational self-talk strategies. However, it is important to highlight that although the current investigation has some common findings with the previous qualitative research, the other studies did not directly measure facilitative and debilitative interpretations of anxiety symptoms. The results of this investigation are, therefore, unique in nature, and not simply a replication that elite performers adopt a well constructed mental skills programme. Specifically, the findings highlight that in a sport, which by its nature requires explosive power, strength and endurance and a high degree of physical arousal to perform optimally, that skills can be combined together to maintain a facilitative perception of pre-race symptoms.

Previous studies highlight the importance, in interpreting these findings, of reflecting on several methodological strengths and weaknesses of the qualitative method used. Limitations to extrapolating the findings include the exploratory nature of the study.
and lack of previous findings on which to draw comparison. Furthermore, the question should be addressed using different sport samples, since the empirical studies on direction have examined performers from other sports. Also, since this research question was generated from a sample which included female performers, a potential weakness was interviewing only male swimmers, and not investigating how the skills were acquired in females.

The greatest weakness relates to the retrospective nature of the interviews, where possible recall concerns and memory decay are a limiting factor. However, Lincoln and Guba (1985) explained that retrospection is a legitimate vehicle for obtaining information, especially when remembering important life events. Supporting this proposal, Wagenaar (1986), highlighted that loss of recall tends to be more salient on insignificant incidents, and not important life events such as major swimming championships.

Nevertheless, this study design had a considerable number of strengths, most importantly the structured interview format that was adopted. This was deemed to be a very successful research method, yielding accounts that were rich in detail and explanation. Furthermore, in view of the fact that the issues investigated in the study had not been previously addressed, this design was advantageous in allowing the swimmers to describe the topic from their individual perspective with no predetermined categories forced on them; that is, they were understood "in their own terms and in their natural setting" (Patton, 1980; p.22). Responding to questionnaires on this issue may not have allowed the swimmers to explain, and for the researcher to probe the issues to the same degree. Indeed, the face-to-face format chosen for the interviews also allowed the researcher to react appropriately to non-verbal cues from the swimmers, which telephone interviews used in previous studies did not allow.

The composition of the sample was a vital strength. Specifically, the swimmers interviewed were information-rich cases of superior quality (Lincoln & Guba, 1985; Patton, 1990), that is, ones from whom, due to their experience and formidable accomplishments, the researcher can learn a great deal about important issues. Furthermore, the swimmers, unlike the previous qualitative studies, were still competing at the highest levels at the time of the interview. Consequently, memory decay regarding the skills the swimmers use now to maintain facilitative interpretations was minimised.

The inductive data analysis process was an important strength of the study, providing a logical structure to essentially unstructured material. The richness achieved by inductively analysing the interviews allowed the relationships to emerge from the data, as opposed to being imposed on them from predetermined categories (Glaser & Strauss, 1967). Also, the consensual validation procedure was important, in view of the fact that
each stage of the analysis has to be agreed upon before the analysis could progress onto
the next stage.

The procedures followed appear to have produced credible, valid and dependable
results. Indeed, all of the subjects responded positively to the interview experience, and
felt that they could tell their story in full and were not lead in any way by the interviewer.
Furthermore, the interpretivist research paradigm makes concerted efforts to establish
trust between the interviewer and the subject (Lincoln & Guba, 1985), which in turn,
allows sensitive topics (e.g. parental pressure) to be discussed. The interviewer felt
confident that the subjects discussed the issues truthfully and felt at ease. However,
possibly the greatest strength of this study lies in the applied implications that emerged,
which become important for sport psychology researchers and practitioners alike.

The importance of maintaining facilitative interpretations prior to competing have
been highlighted in the first two studies in this thesis. Previous research on elite athletes
has highlighted that elite performers have a greater frequency of positive thoughts, and
Gould et al.'s (1992a) study reported that positive affect was a key feature prior to best
performance in Olympic wrestlers. Gould et al. (1993b) reported how experience is often
the best educator, and therefore serious considerations should be given to the
recommendations of these elite swimmers on the central issues of the study.

In summary, the elite performers in this study developed effective strategies over
time which they now use for interpreting pre-race thoughts and feelings as facilitative.
The swimmers have learnt the ability to make the butterflies fly in formation and
positively work for them in competitive situations. An important question emanating
from the findings from this study, therefore, relates to whether researchers can learn the
lessons and recommendations from these elite performers to alter the perceptions of
athletes who suffer from debilitative interpretations of anxiety. The recommendation
would be to conduct intervention research based on these findings and attempt to
cognitively restructure debilitative interpretations of pre-race thoughts and feelings.
Previously, with researchers ready acceptance that anxiety is negative and detrimental
towards performance, treatments would have traditionally attempted to reduce intensity
levels of anxiety; however, the elite performers in this study have provided important
information for intervention programmes suggesting that the level of anxiety should not
be manipulated and reduced. The final study in this thesis, therefore, attempts to make
use of the applied information generated from this study to restructure negative
cognitions of pre-competition mental and physical symptoms. Specifically, the study
addresses the question of whether the butterflies that performers debilitated by their
anxiety symptoms experience can be trained and conditioned to fly in facilitative
formation?
CHAPTER VI

STUDY 4

THE EFFECTS OF A MULTIMODAL INTERVENTION PROGRAMME ON PERFORMERS DEBILITATED BY THEIR ANXIETY:

TRAINING THE BUTTERFLIES TO FLY IN FORMATION

6.1 INTRODUCTION

The previous study used qualitative interview methods to investigate how elite competitive swimmers have acquired the cognitive skills and strategies that enable them to interpret their pre-competitive thoughts and feelings as facilitative. The results established that the swimmers did experience negative experiences when they were young but learned that nerves could be positive. Furthermore, they developed and now follow refined pre-competition and pre-race routines that help them to maintain facilitative interpretations. Consequently, the positive interpretation of their pre-race thoughts and feelings was acquired through natural learning experiences associated with competition, and via educational methods such as taking advice from more experienced individuals. An important question arising from the results of the interviews related to whether debilitating interpretations can be restructured via psychological strategies to interpretations that are more facilitative towards performance.

The final study in this thesis examines the effects of a multimodal intervention programme over a series of ten competitive races on the directional perceptions of four competitive swimmers who, prior to the intervention, interpreted both their pre-race cognitive and somatic anxiety as debilitating. The intervention treatment was devised based on the information generated from the previous study and includes the use of
mental imagery, self-talk and goal setting techniques. These were strategies that emerged as particularly important in the maintenance of facilitative interpretations from the previous study. A second purpose of this study was to educate the swimmers towards a more internal control perspective in regards to the goals that are set for competitive races. This was in view of the fact that performers with a more internal control perspective in Study 2 reported more facilitative interpretations of their anxiety symptoms. Specifically, individuals with favourable expectancies of goal achievement reported positive interpretations as opposed to individuals with unfavourable goal expectancies who reported more negative anxiety interpretations. Therefore, the unfavourable expectancies were associated with goals that the performers perceived as being outside their personal control. These issues were investigated via a staggered single-subject multiple-baseline across subjects design. Single-subject designs have the ability to reveal individual differences, however small, in levels and interpretations of anxiety prior to and following the intervention treatment.

The chapter is reported in the following way. The review of relevant literature comprises four main sections and focuses primarily on the psychological skills that make up the intervention package. The first concentrates on the mental imagery literature and focuses on research evidence, mediating factors on imagery and theories of imagery. Section two discusses self-talk, and examines research findings, the practical uses of self-talk and using the skill to restructure negative cognitions in sports performers. The third section of the literature review reports intervention studies that have treated performers debilitated by their anxiety symptoms. Finally, single-subject design methodology is addressed, highlighting the advantages of this method over group designs and studies which have adopted the methodology. Goal setting, although an integral part of this study will not be discussed in the review of literature because it was discussed in Chapter 4. The review is followed by the purpose of the study and hypotheses. A detailed methodology section follows which introduces the subjects, the criteria followed in their selection and the instrumentation used. The design and procedures are then discussed, including the provision of information to the subjects, details of the content of the intervention treatment and collection of social validation data. Data analysis procedures are then described, followed by the results of the study which report individual goal profiles for each subject and the changes in intensity and direction scores pre and post-intervention for the ten races. The results of the social validation data are then reported. The discussion of the results concludes the chapter highlighting the important practical implications that can be drawn from the study.
6.2 REVIEW OF RELEVANT LITERATURE

6.21 MENTAL IMAGERY

Imagery is one of the most frequently cited psychological skills that performers adopt into their training and competition routines as a means of trying to assist performance (Jones & Hardy, 1990; Mahoney & Avener, 1977; Murphy, 1994; Orlick & Partington, 1988; Smith, 1987). Evidence also exists suggesting the importance coaches place on the utility of imagery skills (Hall & Rogers, 1989; Gould, Hodges, Peterson & Giannini, 1989). Jack Nicklaus (1974) expressed that playing the ball to a certain place in a certain manner is fifty percent mental, and reported how he "goes to the movies" in his mind before every shot he plays. The following quotation from a highly successful Olympic swimmer cited from Orlick & Partington (1988), exemplifies the importance elite performers place on mental imagery:

"I started visualizing in 1978. My visualization has been refined more and more as the years go on. That is what really got me the world and Olympic medals. I see myself swimming the race before the race really happens, and I try to be on the splits. I concentrate on attaining the splits I have set out to do. About 15 minutes before the race I always visualize the race in my mind and "see" how it will go. I see where everybody else is, and then I really focus on myself. I do not worry about anybody else. I try to get those splits in my mind, and after that I am ready to go....You are really swimming the race. You are visualizing it from behind the block. In my mind, I go up and down the pool, rehearsing all parts of the race, visualizing how I actually feel in the water" (p.118-119).

Imagery has numerous practical applications including enhancing physical and perceptual skills, such as rehearsing plans and competition strategies, facilitating psychological skills such as stress management and increasing confidence and recovery from injury. Imagery has received considerable research attention in the field of sport psychology. A full and extensive review of the imagery and mental rehearsal literature is beyond the scope of this study; however, important areas of imagery research are reviewed and discussed.

6.211 Definitions of Imagery and Mental Rehearsal - An Important Distinction

Murphy (1990, 1994), and Murphy and Jowdy (1992), highlighted the importance of distinguishing between the terms 'imagery' and 'mental rehearsal'. Traditionally, these terms have been used interchangeably and synonymously in the literature resulting in confusion. Richardson (1969) provided a clear definition of imagery:
"Mental Imagery refers to all those quasi sensory and quasi-perceptual experiences of which we are self-consciously aware and which exists for us in the absence of those stimulus conditions that are known to produce their genuine sensory or perceptual counterparts" (p. 2-3).

Therefore, imagery\textsuperscript{6.1} uses all the senses to create or recreate an experience in the mind; it is a mental process that can occur in any sensory mode (Murphy & Jowdy, 1992). Conversely, mental rehearsal is the employment of 'imagery' to mentally practise a skill and is therefore a technique as opposed to a mental process (Hardy et al., in press).

\subsection*{6.2.12 Empirical Research}

As alluded to previously, imagery is one of the most frequently reported psychological skills used by performers and advocated by coaches. Indeed, Orlick and Partington reported that 99\% of their extensive sample of elite performers reported using imagery as part of their mental preparation. An extensive review of the literature pertaining to the effects of imagery on performance is far beyond the scope of this chapter; however, Richardson (1967) and Corbin (1972) conducted early extensive reviews on the literature concluding that mental rehearsal is a valuable method in learning and performing sports skills. Feltz and Landers (1983) conducted a meta-analysis on 98 studies from the literature, and with the findings from Weinberg’s (1981) content-based review reported three conclusions. Firstly, mental rehearsal is better than no practise at all. Secondly, mental rehearsal combined with physical practise is more effective than either on its own. Finally, mental rehearsal effects are greater for cognitive as opposed to motor tasks. However, an additional meta-analysis study failed to support the first two of these conclusions (Feltz, Landers & Becker, 1988).

A number of pre-competition interventions, or preparatory arousal studies exist in the literature which involved the use of imagery immediately before performance to try and facilitate the performance of that task. Shelton and Mahoney (1978) established that using imagery as part of a "psyching-up" strategy produced greater performance on a hand grip task with fifteen male weightlifters. This design has been replicated in other studies (Caudill, Weinberg & Jackson, 1983; Weinberg, Gould & Jackson, 1980, 1981); however, imagery effects are difficult to measure due to the other strategies such as attentional focusing and self-talk also being adopted in the psych-up routines.

\textsuperscript{6.1} Although imagery is often referred to by performers as 'visualisation' (as referred to in the example from Orlick & Partington), sight is not the only significant sense in the experience. Visualisation refers purely to visual information; however, imagery includes not only visual but auditory, olfactory, gustatory, tactile and kinesthetic senses (Vealey & Walter, 1993).
Other studies have been conducted requiring subjects to employ a specific imagery strategy prior to performance, with imagery producing positive results (Burhans, Richman & Bergery, 1988; Gould, Weinberg & Jackson, 1981; Woolfolk, Parrish & Murphy, 1985). However, no improvements in performance were uncovered in other studies adopting a similar protocol (Epstein, 1980; Weinberg et al., 1980). The imagery ability of elite versus non-elite athletes has also received considerable research attention since Mahoney and Avener's (1977) study. Comparing qualifiers with non-qualifiers for the 1976 Olympic Gymnastics Team, Mahoney and Avener established that the qualifiers reported a greater frequency of gymnastics dreams and were more likely to use internal imagery (see section 6.213). The questionnaire that was used in this study was subsequently adopted in subsequent research which examined qualifiers versus non-qualifiers or successful versus less successful performers (Gould, Weiss & Weinberg, 1989; Highlen & Bennett, 1979; Meyers et al., 1979). Generally these studies demonstrated that the more successful performers were more likely to engage in success-related dreams about their sport, use internal imagery and use imagery as a problem-solving exercise. Reasons for the equivocal findings that are consistent in the imagery literature will be explored later in section 6.214.

6.213 Mediating Factors: Determining Variables on Mental Imagery

6.2131 Relaxation

Relaxation prior to imagery has been advocated to facilitate imagery sessions due to the enhancement of the clarity of the images (Suinn, 1985; Vealey, 1986). However, a number of studies exist that have found no benefits of using relaxation in combination with imagery (for example see, Gray, Haring & Banks, 1984; Weinberg, Seabourne & Jackson, 1981, 1987). Therefore, Murphy and Jowdy (1992) suggest that although relaxation may interact with imagery, it is not a critical mediating factor in producing imagery effects on performance.

6.2132 Physical Simulation

Only a scant amount of research has addressed the combination of imagery and physically simulating the skill to be performed. Specifically, Meacci and Price (1985) and Ross (1985) demonstrated that imagery effects are greater when the routine is accompanied by the 'physical simulation' of the target skills. This implies for example, that a golfer's imagery rehearsal of a swing would be most effective if the rehearsal also involved the physical simulation of the skill.
**6.2133 Temporal Pacing of the Image**

Only one study has addressed the 'temporal pacing' of the imagery used in mental rehearsal. Andre and Means (1986) hypothesised that the speed of the image may act as a mediating variable on performance. However, their findings established that there were no differences between fast and slow motion. This is surprising in view of the fact that rehearsing skills in slow motion may facilitate the correction of mistakes or bad habits. Furthermore, intuitively, the adoption of implementing images of different speeds into an imagery routine, may facilitate the individual's complete imagery skills.

**6.2134 Imagery Ability**

Another important variable which mediates the effects of mental rehearsal is 'imagery ability'. Murphy and Jowdy (1992) highlighted that good imagery ability has been traditionally defined by two characteristics: vividness (i.e. clarity and reality in the image) and controllability (i.e. the athlete's ability to control the image). However, Hardy et al. (in press) highlighted that these two factors do not necessarily have to go hand-in-hand. Practically speaking, a swimmer may be able to form a very vivid image just prior to executing a competitive racing start, but may not be able to control the image, and may image themselves persistently performing a false start. The ability to image has been found to influence the effects of mental rehearsal on performance (Goss, Hall, Buckolz & Fishburne, 1986; Housner, 1984; Ryan & Simons, 1981; Start & Richardson, 1964). Imagery ability also appears to be a distinguishing factor between elite and less elite performers (Highlen & Bennett, 1983; Meyers et al., 1979; Orlick & Partington, 1988). Also, Orlick and Partington reported that imagery skills and ability of elite performers was not innate, and did require practise to refine the skills and gain total control over the images.

**6.2135 Imagery Perspective**

One of the most commonly cited imagery factors relates to the perspective with which images are viewed. Specifically, 'imagery perspective' refers to the distinction between 'internal' (i.e. athletes see images from behind their own eyes as if inside their own bodies), and 'external' (i.e. viewing as an external observer, outside an athlete's own body as if from a video camera) viewpoints. Some researchers have advocated that internal imagery is superior to the external perspective, in view of the fact that the internal viewpoint closely allies perceptual and kinesthetic experiences of performing in vivo (Corbin, 1972; Lane, 1980; Suinn, 1983; Vealey, 1986). In addition to the research which suggests that elite performers have more refined imagery skills than non-elite performers (Hall, Rogers & Barr, 1990; Mahoney et al., 1987), some research also exists
which suggests that elite performers use a greater preponderance of internal imagery than
less-elite athletes (Mahoney & Avener, 1977; Mahoney et al., 1987; Rotella, Gasneder, Ojala & Billing, 1980). For example, Rotella et al. (1980) established that highly skilled
skiers reported visualising the course from an internal perspective compared with the
external perspective from the less successful skiers.

However, Meyers et al. (1979) failed to replicate this finding with a university
racquetball team, establishing that better performers had better clarity of image and
controllability, but no differences in image perspective. Furthermore, studies examining
the relationship between perspective and performance have generally failed to find
differences (Epstein, 1980; Mumford & Hall, 1985). Murphy (1994) and Murphy and
Jowdy (1992) reported that the results of these studies were highly inconsistent. Furthermore, recent research suggests elite performers adopt both perspectives in their
imagery routines, and therefore, the question of which perspective is better becomes
largely irrelevant (Jowdy, Murphy & Durtschi, 1989; Orlick & Partington, 1988). Nevertheless, White and Hardy (1995), attempted a further explanation, arguing that the
confusion in the literature is the result of researchers failing to differentiate accurately
between internal visual imagery, and kinesthetic imagery. Specifically, they proposed
that performers are capable of forming kinesthetic images equally well when using both
internal and external perspectives. Furthermore, these authors highlighted that the nature
of the task may be an important mediating variable which moderates internal and external
visual imagery on performance.

6.2136 Imagery Outcome

Most imagery studies have examined the effects of positive imagery, or assumed
a successful outcome was central to the subject's image. However, Powell (1973), and
Woolfolk et al. (1985), established that mental rehearsal involving negative outcomes
was associated with performance decrements. Typical tasks involved asking the subject
to rehearse throwing a dart at a target but imaging that it missed the target. This was
attributed to possible disruptions in motor programming or negative influences on
motivation and confidence (Murphy, 1994). Paivio (1985), likewise proposed that
different types of images may result in different cognitive and motivational outcome
effects. For example, performing a well executed back somersault from a ten metre
platform may well enhance the activation of appropriate motor programmes in diving,
whilst the applause of the crowd when excellent judges scores are presented might
enhance performance via increases in self-confidence and subsequent motivation. This is
particularly important in imagery sessions which attempt to simulate and manipulate
competition related thoughts and feelings prior to competition.
6.214 Equivocal Imagery Findings: Possible Explanations

Despite the amount of interesting findings that have emanated from the literature on imagery effects, it is evident that the findings are equivocal. Murphy (1990) maintained that this lack of consistency is partly due to the weaknesses of the study designs and identified several inadequacies: firstly, studies have failed to describe in detail the imagery intervention; and secondly, few studies have conducted manipulation checks to ensure that subjects performed the intervention as instructed; thirdly, designs have been nomothetic in nature, so that individual differences in the ability of the subjects has largely been ignored. Furthermore, most research has examined imagery effects on performance and not directed enough attention towards examining other extremely important personal variables such as arousal control, confidence and motivation levels. Clearly, the effects of imagery on these variables has important applied implications. Also, Murphy (1990) highlighted a lack of valuable assessment instruments available to researchers, criticising the questionnaires used in the early studies developed initially by Mahoney & Avener (1977). In response to this criticism Hall, Mack and Paivio (in press) recently developed the 30 item 'Sport Imagery Questionnaire' (SIQ) to measure five different types of imagery: Cognitive General (e.g. successfully imaging the execution of performance plans); Cognitive Specific (e.g. imaging skills being perfectly executed); Motivational General-Control (e.g. imaging staying focused when confronted with problems); Motivational General-Arousal (e.g. imaging the general emotions that accompany performance); and Motivational Specific (e.g. imaging the achievement of specific goals and outcomes).

Hall et al. (in press) administered the SIQ to 57 elite competitive rollerskaters in addition to the State Sport Confidence Inventory (SSCI; Vealey, 1986). Findings revealed that the skaters who were highly confident prior to performance generally used more 'Motivation General Control' and 'Motivation General Arousal' imagery than the less confident skaters. Also, Vadocz and Hall (in press), using the same sample, established that using control images (e.g. remaining in control in problem situations) was also associated with lower pre-performance cognitive anxiety than the other imagery types. Hardy et al. (in press) highlighted that these recent findings support Murphy's (1994) observation that evidence does exist suggesting that different types of images influence performance via different mechanisms. Also, as Hall and associates' work suggests, 'what you see is what you get'. Specifically, performers become confident by imaging themselves being confident and not as previously thought by imaging a perfect performance. One final weakness relates to the literature generally failing to offer and examine the theoretical explanations of imagery effects on performance. Therefore, the
next section will focus on the various theoretical developments in the area of mental imagery.

6.215 Theoretical Developments: Theories of Imagery Effects

Hardy et al. (in press) commented how the last weakness described above by Murphy (1990) was particularly evident in the sport psychology literature, as only 'Psychoneuromuscular' and 'Symbolic Learning Theory' are commonly cited as explanations of how imagery works. The rationale for the inclusion of imagery theories in this review rests on the notion that they highlight important considerations for the development of the imagery scripts and routines used in this study.

6.2151 Psychoneuromuscular Theory

This theory, developed by Jacobson (1930), suggests that in an imagery routine, impulses are transmitted from the brain to the muscles as if physical execution of the skill has taken place. Therefore, vivid images produce innervation in the muscles which are similar to that produced in the actual movement (Vealey & Walter, 1993). Specifically, during mental rehearsal the relevant motor programme is actually loaded and run, but with "gain controls" turned down (Hardy & Wyatt, 1986). Therefore, the result of this process is EMG activity which closely mirrors, although at a lower intensity level, the EMG activity that results when the physical skill is performed. A frequently cited illustration is that reported by Suinn (1980), who reported how a downhill ski racer used imagery to recreate an alpine race run. The electrical activity monitored in the leg muscle established a printout which mirrored the terrain of the ski run. However, studies testing this theory have either lacked experimental control (Jacobson, 1930; Suinn, 1976), or failed to show appropriate patterns of action potentials during the mental rehearsal (Hale, 1982; see Feltz & Landers, 1983).

6.2152 Symbolic Learning Theory

Sackett (1934) proposed a rival to the psychoneuromuscular hypothesis called 'Symbolic Learning Theory'. This suggests that imagery may function as a coding system to aid performers acquire and understand movement patterns. The basic premise of the theory highlights how all movements are encoded in the central-nervous-system when a blueprint or plan of the movement is constructed (Vealey & Walter, 1993). Consequently, imagery facilitates performance by aiding the athletes to blueprint or code their movements into symbolic components, consequently making a movement more familiar and automatic. Specifically, Sackett (1934) proposed that mental rehearsal allows the performer to rehearse the symbolic or cognitive aspects of the task (e.g. strategies
required for the task and spatial and temporal sequencing of the required movements). Therefore, mental rehearsal should aid the motor programme only to the extent that such cognitive factors play an important part in the task.

Experimental studies testing the hypotheses of this theory have generally been consistent (Hall & Erffmeyer, 1983; Minas, 1980; Wrisberg & Ragsdale, 1979). However, Murphy and Jowdy (1992) concurred that the literature does not appear to support the view of centrally based mechanisms in establishing the effectiveness of mental rehearsal, as opposed to the peripherally based Jacobson (1930) theory. Furthermore, Murphy and Jowdy (1992) suggested that symbolic learning theory is too simplistic and fails to explain why mental imagery results in facilitative effects. Consequently, these authors have explored alternative explanations primarily in the area of clinical psychology, namely 'Bio-Informational Theory' (Lang, 1977, 1979, 1984) and Ahsen's (1972, 1984) 'Triple Code Theory'.

6.2153 Bioinformational Theory

The central tenet of this theory assumes an image is an organised set of propositions stored in the brain's long-term memory (Lang, 1977, 1979). Specifically, bio-informational theory is an efferent-oriented view of imagery (Cuthbert, Vrana & Bradley, 1991) and is based on the assumption that an image is "a functionally organised, finite set of propositions stored by the brain" (Murphy, 1990; p.165).

Bioinformational theory importantly distinguishes between stimulus and response propositions. Stimulus propositions describe the content of the scenario behind the image, and are divided into two types of information (Lang, 1984). The first type of stimulus information includes the descriptive referral to elements of the external environment. In swimming for example, stimulus information might include the noise of the crowd, the sound of the gun and feel of the wall or timing pads on the feet during a tumble turn. The second type of stimulus information involves semantic elaboration pertaining to the event, such as the importance of the race. For example, it is the final turn in the race and you are head-to-head with another swimmer etc. (Cuthbert et al., 1991).

Response propositions are statements that describe the individual performing the mental rehearsal in response to the stimulus in the image, and are designed to "produce the relevant physiology during imagery" (Cuthbert et al., 1991; p.7). Responses might include those produced by somatomotor systems such as limb flexion and eye movement, as well as autonomic activity such as increases/decreases in heart rate and tension in the muscles. Therefore, responses in the tumble turn might include a pounding heart, holding breath or exhaling through the nose, as well as the body movements in executing the turn.
Consequently, for imagery to facilitate sports performance response propositions must be activated so they can be modified, improved and strengthened (Vealey & Walter, 1993).

The important applied implication generated from this theory is that imagery scripts should include both types of propositions, as this is more likely to create vivid images than providing solely stimulus propositions on their own (cf. Lang, Kozak, Miller, Levin & McLean, 1980).

6.2154 Triple Code Theory

The 'triple code model of imagery' (Ahsen, 1972, 1984), elaborates to a degree on Lang's propositions and also includes a third essential aspect of imagery, relating to the actual meaning of the image. Murphy (1990) explained that "According to Ahsen, every image imparts a definite significance or meaning to the individual. Further, every individual brings his or her unique history into the imaginal process, so that the same set of instructions will never produce the same imagery experience for any two individuals" (p. 167).

In summary, despite the inconsistencies in the research, a number of encouraging findings have emerged, suggesting the beneficial effects of using imagery. However, it is evident that researchers in all academic areas, and not solely sport psychology, are unclear about the mechanisms via which imagery works.

6.22 SELF-TALK

Virtually all sports performers talk to themselves at some time during their training sessions, before competition and actually during performance. Some individuals openly talk to themselves outloud while others engage in an internal dialogue. Despite the frequency that self-talk is cited in performers' mental preparation routines, it has often been referred to in the sports psychology literature in an indistinct and imprecise way. Bunker, Williams and Zinsser (1993) forwarded a typical 'thought content' definition of the skill, highlighting "the key to cognitive control is self-talk.... anytime you think about something, you are in a sense talking to yourself" (p.226). More precisely, Hackfort and Schwenkmezger (1993) claimed that what athletes say to themselves is the critical factor, and highlighted the central role language plays in self-talk in the form of internal self-statements. Therefore, research into self-talk has adopted both a 'self-statements' and 'thought content' perspective.

6.221 Research Findings: Positive Self-Talk as a Predictor of Success or Failure

Some field-based research exists that shows that thought content and self-statements are important predictors of success in sport. For example, Mahoney and
Avener's (1977) study established that the content of the qualifying gymnasts' self-talk differed markedly to the gymnasts who failed to qualify for the Olympic team, with the more successful performers reporting positive self-statements. Conversely, the less successful non-qualifiers reported self-doubting verbalisations accompanied by images of performance failure. These results have been supported in other research studies (Dorsel, 1988; Kendall, Hrycaiko, Martin & Kendall, 1990; Klinger, Bart & Glass, 1981; Orlick & Partington, 1988; Weinberg, Smith, Jackson & Gould, 1984). Specifically, Orlick and Partington (1988) established that the best athletes had developed systematic procedures for drawing upon their strengths when mentally preparing for competition including positive thoughts and positive self-talk strategies which were not evident in the performers who failed to perform well at the Olympics. However, these findings are far from consistent, in that, some studies have found no differences in the content of self-talk between successful and less successful performers (Dagrou, Gauvin & Halliwell, 1991; Rotella et al., 1980). Indeed, Highlen and Bennett (1983) found that elite competitive divers used less positive self-talk than the non-elite performers.

Findings from experimental-based studies are more consistent, reporting that positive self-talk is indeed associated with higher levels of performance (Dagrou et al., 1992; Johnston-O'Connor & Kirschenbaum, 1986; Van Raalte, Brewer, Lewis, Linder, Wildman & Kozimer, in press). Specifically, Van Raalte, Brewer, Rivera and Petitpas (1994) reported that negative self-talk was associated with losing in tennis players, and the more successful believed more in the use of positive self-talk. Conversely, additional research exists which reports that negative self-talk is a factor in poor performance (Dagrou et al., 1992; Rotella et al., 1980; Van Raalte et al., in press).

6.222 Practical Uses of Self-Talk

It is not completely understood why positive self-talk works. However, self-confidence (Feltz & Reissinger, 1990; Gould et al., 1989; Gould & Weiss, 1981; Wilks & Summers, 1984) and anxiety control (Ellis, 1982; Mace & Carroll, 1986; Meichenbaum, 1977) may be mediating factors. Specifically, Gould et al. (1989) reported that elite collegiate and national team coaches advocated and systematically encouraged the team members to develop positive self-talk strategies. Ellis (1982), highlighted that non-achievement of goals and performance decrements were the result of performers' acceptance of self-defeating irrational beliefs. Ellis argued that this mode of thinking is counterproductive due to its negative influence on confidence levels.

Also, as Hardy et al. (in press) explained, despite the emphasis that mental training programmes place on 'appropriate' self-talk (Kirschenbaum & Bale, 1984; Meyers & Schlessner, 1980; Rushall, 1984) few controlled studies exist that operationalise
the word 'appropriate' in an empirically based design. However, it is known that self-
defeating self-statements have a negative effect upon performance (Rosin & Nelson, 1983; Rotella et al., 1980) and 'thought stopping' can be used to modify these self-
defeating statements (Meyers & Schleser, 1980). Specifically, thought stopping involves
the elimination of negative or counterproductive thoughts via briefly focusing on the
negative cognitions and then utilising a cue word or trigger to stop the thought.
Furthermore, self-statements can be used to effectively trigger the individuals' desired
actions (Silva, 1982), and self-statements can be used to provide self-reward (Deci &
Ryan, 1985). Bunker et al. (1993) proposed that self-talk can be an effective technique
to aid the maintenance of energy and persistence and controlling and even increasing
effort levels (Harris & Harris, 1984; Rushall, 1984).

A common use of self-statements relates to creating a certain mood
(Meichenbaum, 1975; Owens & Bunker, 1989; Silva, 1982) and modifying a mood state
(Finn, 1985; Hardy & Fazey, 1990). Specifically, affective cues have the ability to result
in performance changes. Meichenbaum (1975), for example, established that athletes
repeating the cue word "fast" or "quick" produced faster leg speed. Furthermore, power
words such as "blast" were effective for explosive movements, such as starting from
blocks in sports such as athletics and swimming (Silva, 1982). When attempting to
modify mood, Finn (1985), for example, advocated that athletes suffering from under-
arousal should combine self-talk and breathing alterations to attain their desired
emotional state. Conversely, Hardy and Fazey (1990) advocated the use of a cue word or
'mantra' in meditative relaxation techniques to lower the level of cognitive anxiety.

Finally, Schmid and Peper (1993) advocated that self-talk strategies can be used
to regulate and maintain attention control in sports situations, and self-talk can facilitate
recovery from injury (Ieleva & Orlick, 1991). These authors established that athletes
making a speedy recovery from ankle and knee injuries had greater frequencies of
positive self-talk concerning their recovery process than performers who recovered more
slowly.

6.223 Restructuring Negative Cognitions

As alluded to previously, what performers repeat to themselves is a critical
component of appropriate cognition, in that, thoughts directly affect feelings, and as
suggested by certain research, also the performance. Consequently, individuals need to
train themselves to think effectively. Resulting from clinical psychology research, a
number of different techniques generally labelled 'cognitive restructuring' methods have
become popular. All the techniques have similar basic premises and attempt to alter self-
statements. Research on 'coverant control' reported a technique which involved
restructuring maladaptive thoughts via the reinforcement of alternative cognitions. The development of 'Rational Emotive Therapy' in clinical psychology (Ellis, 1962, 1970) reported that irrational interpretations of objective reality fundamentally cause emotional disorders. Ellis advocated, therefore, that it is crucial to be able to recognise self-defeating irrational cognitions and replace them with cognitions that are more constructive and rational. Indeed, interviews with elite figure skaters (Gould, Finch & Jackson, 1993) and wrestlers (Gould, Ecklund & Jackson, 1993) show that the use of rational thinking and positive self-talk strategies are commonly cited and effective coping strategy in dealing with competitive stress. Meichenbaum's (1973) work on the basic premise of Ellis describes a technique called 'Self-Instructional Training' which focuses on replacing anxiety-inducing cognitions with constructive problem-solving self-statements. This technique, as reported by Bunker et al. (1993), can be particularly effective for changing bad habits in sports skills. Beck's (1970, 1976), variation incorporates 'automatic thoughts' which can occur involuntarily in a state when people think negatively. Specifically, the central tenets of Beck's proposition relates to training the individual to become aware of inappropriate thoughts and employ effective coping strategies to deal with them.

Not surprisingly, the basic principles of these therapies from mainstream psychology have been transferred into the applied sports psychology area, with researchers advocating the use of self-statements to restructure negative cognitions (Gould & Damarjian, in press; Jones, 1993; Weinberg, 1989). This restructuring process is labelled as 'countering' by Bunker et al. (1993) which refers to an internal dialogue which uses fact and reason to counter or discredit the beliefs and assumptions that caused the negative thoughts. Bunker et al. (1993), advocated restructuring self-defeating thoughts to self-enhancing thoughts; for example, altering a performer's negative cognition of: "I can't believe it's raining. I have to play in this rain", to the enhancing thought of: "No one likes the rain, but I can play as well in it as anyone else" (p.234). Gauron (1984), in a similar technique to 'countering', advocates the skill of 'reframing' to aid the athlete in creating a positive internal dialogue via the creation of alternative frames of reference or different ways of looking at the world (Bunker et al., 1993).

As is evident from the previous discussion, only a scant amount of research has addressed self-talk strategies. This is not surprising in view of the practical difficulties in conducting empirical research, particularly relating to the difficulties in data collection. Specifically, over intrusiveness on the part of researchers or conversely, problems with retrospection are potential problems in amounting data on self-talk. Furthermore, prior to additional research being conducted, the lack of a precise definition and what actually constitutes the skill of self-talk requires attention.
INTERVENTION RESEARCH ON PERFORMERS DEBILITATED BY THEIR ANXIETY SYMPTOMS

Only a scant amount of research has addressed intervention effects on performers debilitated by anxiety. Maynard, Hemmings and Warwick-Evans (1995) examined intensity and direction dimensions via the modified CSAI-2, in a sample of soccer players. The subjects were dichotomised into intervention groups based on their direction scores. Subjects most debilitated by somatic anxiety then participated in an eight week applied relaxation programme, with the remainder of the subjects forming a control group. Following the intervention both somatic and cognitive anxiety intensity decreased by approximately 16% and 31% respectively. Direction scores for both somatic anxiety and cognitive anxiety became more facilitative with the decrease in intensity. Furthermore, self-confidence increased in the intervention group. The authors therefore concluded support for the "matching hypothesis" (Morris et al., 1981) and suggested that reductions in state anxiety allied with confidence increases are interpreted positively towards upcoming performance.

In a second study, Maynard, Smith and Warwick-Evans (1995), examined 16 semi-professional soccer players using the modified CSAI-2 twenty minutes prior to competition. The authors dichotomised the subjects into those debilitated by cognitive anxiety (n=8) and those debilitated by somatic anxiety (n=8) who undertook the intervention over a period of twelve weeks. Performers who interpreted both cognitive and somatic anxiety as facilitative became control subjects. The aim of the study was to further examine the matching hypothesis by implementing a cognitive stress management intervention programme. The treatment administered via scheduled meetings involved a positive thought control strategy (Suinn, 1987), which covers three areas: using negative thoughts in a positive way; controlling negative thoughts; and, training positive thoughts. Specifically, emphasis was placed on thought stopping techniques, in addition to constructing positive affirmation statements in an attempt to counter any negative thoughts. Results revealed that in both treatment groups cognitive and somatic anxiety intensity decreased, which was accompanied by an increase in self-confidence. In the control group, intensity scores also increased for all three subscales, but to a lesser degree. Cognitive anxiety direction became more facilitative in both treatment groups but was most facilitative in the group debilitated by cognitive anxiety, with increases of 54.4% and 29.47% respectively. Similar findings emerged for somatic anxiety direction, in that the group debilitated by their somatic anxiety reported a greater increase in facilitation than the group debilitated by cognitive anxiety (49.78% versus 23.41%). Interestingly, the control groups directional interpretations also became more facilitative for both subscales. These authors, therefore, suggested partial support for the matching
hypothesis, in that, although cognitive anxiety intensity decreased in the eight subjects debilitated by cognitive anxiety, somatic anxiety intensity also decreased. This supported Parfitt and Hardy's (1993) contention that the matching hypothesis is too simplistic. The findings from Maynard's study suggested that decreases in intensity of state anxiety and increases in self-confidence were associated with more facilitative interpretations of their anxiety symptoms. These results are interesting, and indeed it would be expected that higher self-confidence would be accompanied by more facilitative interpretations. However, although the results suggest that lower intensities of state anxiety are associated with more facilitative interpretations, this may be a function of the sample size and composition, the study design adopted and the type of sport investigated. Specifically, the results of the first two studies in this thesis suggest that no differences in intensity levels were evident between elite and non-elite groups, and positive and negative goal expectancy groups. However, the elite group and the positive goal expectancy groups both reported their state anxiety as more facilitative. The results of Study 1 and Study 2 therefore suggest that facilitative interpretations can be experienced at higher intensity levels of state anxiety, which was not the case in Maynard's study. It is possible that the football sample was not as elite as either of the studies reported in this thesis, and as Maynard accepts, the small sample size for the type of study design adopted limits the generalisability of the findings.

6.24 SINGLE-SUBJECT DESIGNS

6.241 Design Rationale

A large amount of research in sport psychology, particularly intervention research, has adopted a nomothetic (group) experimental approach, where relationships have been examined across large groups of subjects using settings and tasks which are low in ecological validity. Martens (1987) argued that sport psychologists need to utilise idiographic (individual) approaches to progress and develop new knowledge in the field. Furthermore, Greenspan and Feltz (1989) have called for more research investigating real-life competitive sports environments with current active performers. Prapavessis, Grove, McNair and Gable (1992) advocated that researchers need to respond to individual differences when working with elite athletes, and not simply work on the basis of group comparisons. Intervention research using imagery and other psychological skills has traditionally used nomothetic designs (Murphy, 1990). However, as recognised by Borg and Gall (1989), idiographic approaches such as single-subject designs permit the detection of individual behaviour modifications over a set period of time.
Single-subject designs monitor an individual's behavior prior to, and after, the intervention treatment is implemented. Differences in behavior between the pre-treatment (i.e., baseline) phase and the post-treatment intervention phase are then observed. Bryan (1987) claimed that in this way the subject acts as his/her own 'control' during the baseline period prior to the treatment. Kazdin (1982) highlighted that the rationale behind single-subject designs is similar to traditional group designs. Specifically, both types of study look to observe differences in behavior under different conditions. The important distinction is that nomothetic designs aim to expose different groups of individuals to different experimental conditions.

### 6.242 Design Variations

Bryan (1987) highlighted that there are different types of single-subject designs available, primarily the ABAB design and the multiple baseline design. The ABAB design involves establishing baseline measures in the first A phase and then implementing the treatment in the B phase. In the second A phase the treatment is withdrawn, and then reintroduced in the final B phase. Consequently, if changes in behavior occur in the intervention phases (B) of the study over the baseline (A phases) then these changes can be attributed to the treatment. Adopting this design, Allison and Allyon (1980) demonstrated that blocking performance in youth American football players did improve in the B phases of a study with this design. A potential problem with designs of this nature focuses around the withdrawal of the treatment. Specifically, the performers may be reluctant to reverse the gains made in the first B phase when the treatment is withdrawn in the second A phase of the study. Secondly, if the treatment is successful, as would be the aim of the study, then the behavior may not reverse when the treatment is withdrawn; that is, permanent changes may have occurred.

The weaknesses of these ABAB type designs can be eliminated by using multiple-baseline single-subject designs. This design collects baseline measures prior to the intervention being implemented. Bryan (1987) explained that in a multiple-baseline design "evidence that a particular intervention has produced a change in behavior is obtained by demonstrating that behavior change occurs if, and only if, intervention is applied" (p.286). Variations of this design, include: data may be collected across multiple baselines of behaviors for one individual (across behavior); one specific behavior of one individual in differing situations (across settings); or as is most useful in applied sport psychology, one behavior of several individuals (multiple-baseline across-subjects). Koop and Martin (1983) demonstrated the effectiveness of the across subjects design when examining the error-correction rate in competitive swimming strokes in young swimmers. Results revealed that error rates decreased only when the treatment
was applied. One important variation on traditional multiple-baseline research is that of a non-concurrent or staggered-baseline design (Barlow & Hersen, 1984). Specifically, the intervention is only implemented when baseline observations have stabilised, and therefore, the subjects start the intervention treatment at different times depending on their individual baseline responses. This is a particularly strong design which provides the researcher with a degree of flexibility for the designated point in time when the treatment will be introduced to each separate subject. This design has been successfully applied to sport by Cohn, Rotella and Lloyd (1990) who examined the effects of a cognitive-behavioural intervention on three male elite intercollegiate golfers. Cohn et al. (1990) introduced the treatment at different times to the three subjects (staggered baseline), and established improvements in the players' adherence to mental and behavioural pre-shot routines following the treatment. Furthermore, the players indicated via post-treatment interviews that they felt the intervention did have a positive effect upon performance.

6.243 Design Strengths and Weaknesses

In view of this study adopting a completely different methodological approach (i.e. working closely with a small number of performers with the aim of modifying behaviour), it seems appropriate to consider the strengths and weaknesses of the single-subject designs in comparison to group designs. Barlow and Hersen (1984) highlighted problems with group designs from their work in psychotherapy, of which certain problems are particularly salient in the field of sport psychology such as: ethical issues of withholding treatments to the control subjects which may be potentially beneficial; practical complications of large data collection exercises; and, obscuring individual results via group averages.

Single-subject designs allow the detection of any intervention effects, however small, that may have been lost in traditional study designs where a non-significant result may have been the result (Wollman, 1986). Also, this type of design may be better suited to working with elite performers who may not show considerable improvement from the pre-training baseline level. Consequently, Wollman (1986) contended: "Small but consistent changes may be seen in a single-subject design but not emerge significantly in a group design" (p.136). Furthermore, Zaichowsky (1980) highlighted that single-subject designs incorporating imagery interventions facilitate some practical research concerns such as working with smaller numbers, and avoiding asking coaches or athletes to participate in an intervention that will not facilitate performance. Smith (1988) maintained that designs of this nature can provide insight into underlying processes in
sport behaviour by serving as a source of observations concerning the intervention technique.

Despite the strengths of single-subject design, studies tend to have low external validity, in that the researcher cannot generalise to how others might respond to the treatment (Zaichkowsky, 1980; Sharpley, 1986; Borg & Gall, 1989). The weaknesses can be limited, however, via replication of the results in further studies (Borg & Gall, 1989; Seidentop, 1981) and adopting the across-subjects design. Additionally, internal validity can be increased via the use of multiple-baseline single-subject designs. Adopting this type of design, the researchers conducting the study can be more certain that it is the intervention that causes the effect differences and not other factors such as a Hawthorn effect (Borg & Gall; Hersen & Barlow, 1976).

The change in behaviour above the baseline in single-subject designs can be assessed in a number of ways. The most common method involves the visual inspection and appraisal of the data which is commonly represented graphically by plotting the behaviour measures over time. Specifically, by the observation of the number of overlapping data points between the pre-intervention and post-intervention phases, the impact of the behaviour change can be observed. The greater the frequency of overlapping data the lower the impact of the treatment. Jones, Vaught and Weinrott (1975) criticised this method for relying too heavily on subjective interpretation; however, this tends to be the preferred method in the few sport psychology single-subject designs available, particularly since applied researchers are more concerned with practical significance than statistical significance (Bryan, 1987). Finally, visual inspection may be particularly salient when examining elite performers when differences between the baseline and treatment phases may be minimal.

6.244 Research Findings

Despite the advantages of single-subject designs, only a scant amount of research has been carried out further to the studies of Allison and Almony (1980), and Koop and Martin. Kendall et al. (1990) established performance improvements in the defensive skills of four female basketball players by the implementation of a treatment which included relaxation, imagery and self-instruction. Furthermore, Greenspan and Feltz (1989) reviewed additional studies that utilised the advantages of single-subject designs. Specifically, although all of these studies showed improvements in performance, they tended to be multimodal studies that predominantly used relaxation as part of the treatment (e.g. Hamilton & Fremouw, 1985; Heyman, 1987; Komaki & Barnett, 1977; Meyers, Schleser & Okwumabua, 1982). Recently, Shambrock, Bull & Douglas (1994) adopted a multiple-baseline across-subjects design to assess the effects of imagery
training on free throw basketball performance. The four female subjects, all regular competitors in the sport, improved performance following the implementation of the treatment. Furthermore, Swain and Jones (1995) examined the effects of a goal setting intervention on subcomponents of basketball performance of four elite college basketball players. The intervention programme was based on Smith's (1988) goal attainment scaling recommendations, where the subjects generated numerical targets for their subcomponent performance goal (e.g. turnovers, steals, rebounds, shot percentage or assists). The intervention was introduced at the half-way point in the competitive season and results indicated that three of the four subjects showed considerable performance improvements in their targeted areas. Also, findings revealed that only the subcomponent targeted by the intervention improved with no outcome changes in the other subcomponents of performance.

Therefore, although research is limited in the sport environment, the results of the available studies support the use of single-subject designs in intervention research as a valuable method of investigation. On a final point, despite the apparent value of using these designs, as recognised by Greenspan and Feltz (1989), there is a lack of follow-up assessments after the post-test to address the retention effects of the intervention. Therefore, although collecting data following the completion of the study may not be practical, follow-up assessments should be incorporated in future study designs.

6.245 Social Validation

The need for social validation in single-subject designs has been expressed as crucial for additional individual verification of the results from the actual subjects who participated (Kazdin, 1982; Kendall et al., 1990; Wolf, 1978). Social validation refers to the collection of subjective evaluations of subject's performance or behaviour from individuals who were involved in the investigation. Wollman (1986) highlighted that in studies such as this there is a need to observe closely the internal experiences of the subjects under investigation. Via the collection of social validation data, the researcher is then able to provide a manipulation check by assessing how each research subject actually experienced the intervention. Consequently, a more accurate assessment of the internal validity of the findings can be made. Smith (1988) highlighted that if the findings from a single-subject design are consistent in enough subjects, the researcher can be confident that it is the treatment which has caused differences in behaviour and, therefore, external validity is retained. Kendall et al. (1990) recommended that the social validation should be assessed in three areas of the study: firstly, the subjects' interpretations of the central aims of the study; secondly, if the subjects interpret any
behaviour changes to be significant; and thirdly, if the procedures used in the study were acceptable to the subject.

6.3 STUDY 4: PURPOSE OF THE STUDY

The major purpose of this study was to examine the effects of a multimodal intervention programme on the directional perceptions of competitive swimmers debilitated by their pre-competition anxiety symptoms via a staggered single-subject multiple-baseline design. Specifically, the intervention was directed towards restructuring debilitative interpretations to facilitative interpretations, and was based on the information generated from the elite swimmers Study 3. Four competitive swimmers agreed to participate in the study, of which three received the intervention treatment, with the other swimmer acting as a control. This subject was included to ensure that no external factors mediated directional perceptions of anxiety, and if this did occur to examine the reasons why.

Emanating from the findings of the second study, a further purpose of this study was to modify the swimmers' goal setting strategies to a more internal control perspective regarding the targets they set for their competitive races, i.e., to set more internal intrapersonal goals rather than external interpersonal goals. Specifically, Study 2 established that performers with more positive goal attainment expectancies reported more facilitative interpretations of their pre-race anxiety symptoms. Therefore, there is an increased likelihood of positive expectations and subsequently facilitative anxiety interpretations from goals that can be achieved independently of other competitors such as performance and process goals as opposed to outcome goals.

6.3.1 HYPOTHESES

Due to the exploratory nature of this study, only general hypotheses were formulated. However, based on the findings from the previous three studies in this thesis, it was expected that:

(1) The three swimmers receiving the intervention would report more facilitative interpretations of their pre-competition anxiety following the implementation of the treatment;

(2) The subjects taking part in the intervention would report higher levels of self-confidence following the intervention;
The control subject would consistently report debilitative interpretations of pre-competition anxiety throughout the study;

The control subject's self-confidence level would remain stable throughout the study.

No hypotheses were formulated regarding the secondary aspect of the study regarding attempting to direct the subjects towards a more internal control perspective towards the goals set for races. This was in view of the fact that the subjects' preferences for setting different types of goal has not been established prior to the study. Specifically, no baseline measures of goal setting strategies were collected preceding the study.

6.4 METHOD

6.4.1 SUBJECT SELECTION CRITERIA

In order to address the research question, the subjects receiving the intervention needed to interpret both pre-competition cognitive and somatic anxiety as clearly and consistently debilitative towards their upcoming performance. Thus, the first part of the study entailed finding such subjects. In order to ensure that the subjects were debilitative in their interpretations, a two-step procedure was implemented prior to asking the subjects to further participate in the study. Firstly, state measures of intensity and direction of cognitive and somatic anxiety were recorded via the modified CSAI-2 (see Chapter 3; section 3.421) from at least two competitive races from the previous season. Eight potential subjects were originally targeted for the study, and completed the modified CSAI-2. The swimmers were targeted from competitive swimming clubs from the surrounding area for practical reasons of working one-on-one with the author throughout the study. The performers were initially chosen to complete the questionnaire based on their coaches and author's experience of their pre-race mental state (i.e. that they frequently tended to be in a negative frame of mind prior to a race). The results of the modified CSAI-2 from the potential eight subjects are presented in Table 6.1.

Following the first stage of the selection procedure, the subjects with clear and consistent degrees of debilitation on both cognitive anxiety and somatic anxiety were asked to proceed to the second step of the subject selection criteria (represented in Table 6.1 as Subjects 1 to 4). This involved the completion of a modified version of the CTAI-2 (see Chapter 5; section 5.41) to assess their usual reaction to the interpretation of pre-race anxiety symptoms. The results of CTAI-2 are presented in Table 6.2.
Table 6.1 Modified CSAI-2 Raw Scores for Potential Subjects

<table>
<thead>
<tr>
<th>Subject</th>
<th>Intensity Scores</th>
<th>Direction Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CAI</td>
<td>SAI</td>
</tr>
<tr>
<td>1</td>
<td>Race 1</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>Race 2</td>
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<td>2</td>
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<td>3</td>
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<td>4</td>
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<td>Race 1</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>Race 2</td>
<td>29</td>
</tr>
</tbody>
</table>

A discussion of the results of the CTAI-2 (as conducted in the subject selection procedure for Study 3; section 5.41) was not carried out in this study to check for debilitative interpretations of anxiety symptoms. This decision was made because the discussion may have biased the subjects and partially informed them of the purpose and aims of the study.
Table 6.2 Modified CTAI-2 Raw Scores for Study Subjects

<table>
<thead>
<tr>
<th>Subject</th>
<th>Intensity Scores</th>
<th>Direction Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CAI</td>
<td>SAI</td>
</tr>
<tr>
<td>1</td>
<td>21</td>
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<td>23</td>
</tr>
<tr>
<td>4</td>
<td>22</td>
<td>20</td>
</tr>
</tbody>
</table>

6.4.11 Subjects

The subjects who met the selection criteria comprised three male members of the Loughborough University National Competitive Swimming Squad, and one male member of the Nottinghamshire Squad (mean age of 21.75 years; SD=2.22). Males were targeted for the study in view of the fact that the interviews with elite swimmers in the previous study were conducted with males only. All four subjects competed in ten separate competitive races throughout the first swimming cycle of the 1995-1996 season (i.e. September to December, 1995). Greater detail on the subjects will be provided immediately prior to the results of each individual swimmer in sections 6.51-6.54 respectively.

6.42 INSTRUMENTATION

6.4.21 Sports Imagery Questionnaire

In view of the fact that the intervention programme would require mental imagery sessions, the subjects also completed an imagery questionnaire to assess the skill and ability of the swimmers to image competently. The rationale behind this procedure was that if the subjects did not possess adequate imagery skills, these skills would have to be taught, practised and refined prior to the intervention treatment being implemented. This was examined via the completion of the 'Sports Imagery Questionnaire' (Martens, 1982). The questionnaire assesses six dimensions of imagery ability including: 1) visual (clarity of the image); 2) auditory (associated sounds accompanying image); 3) kinesthetic (the feel associated with the image); 4) emotions (experiencing the emotions associated with
the image); 5) controllability (being able to control the image); and, 6) perspective (imaging an internal perspective). These abilities are assessed across four different situations including practising skills alone, with others, watching a teammate and playing in a contest. A five point Likert scale assessed the items on the four dimensions ranging from 1 ("no image") to 5 ("extremely clear and vivid image"). For the controllability items the scale ranged from 1 ("no control of the image") to 5 ("complete control of the image"); therefore, possible scores on each dimension ranged from 4 to 20. Additionally, the perspective items required 'yes' or 'no' response as to whether the subject could see the image from inside the body (internal perspective). The questionnaire was adapted slightly to incorporate swimming-specific terminology and is presented in Appendix 17. The results of the SIQ, illustrated in Table 6.3, revealed very competent imagery skills\(^6.2\) on all six imagery abilities and consequently, no further tuition on imagery was included in the study.

Table 6.3  SIQ Raw Scores for Study Subjects

<table>
<thead>
<tr>
<th>Subject</th>
<th>Visual</th>
<th>Auditory</th>
<th>Kinesthetic</th>
<th>Emotion</th>
<th>Control</th>
<th>Internal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>16</td>
<td>12</td>
<td>12</td>
<td>18</td>
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<td>17</td>
<td>19</td>
<td>14</td>
<td>17</td>
<td>18</td>
<td>4</td>
</tr>
</tbody>
</table>

\(^6.2\) Modified CSAI-2
The modified CSAI-2 was used to measure the intensity and direction dimensions of pre-race cognitive anxiety, somatic anxiety and also self-confidence. Refer to section 3.4.21 in Study 1 for additional details on this questionnaire.

\(^6.2\) It is important to recognise that although these swimmers were 'debilitators', they were still very high standard performers competing up to national standard. Intuitively, although they were familiar with psychological skills, and used them regularly, it is not unreasonable to suggest that the type of skills they used were not appropriate; for example, focusing on external factors such as opponents rather than internal factors within their control such as their own race plan and processes. Therefore, the intention was not to teach skills such as imagery but to restructure the content of the psychological skills. It is also important to highlight that the first questionnaire developed by Martens (1982) has not been validated but was deemed a useful initial instrument to check overall imagery abilities.
6.423 Pre-Race Goal Setting Questionnaire

The pre-race goal setting questionnaire was used to gain information on the types of goal that had been set for the race (Appendix 18). The written instructions provided to the swimmers on the goal setting questionnaire have been described in Chapter 4 (section 4.423). The questionnaire was divided into three sections which asked about outcome performance and process goals respectively. Within each section, subjects were asked to specify the goal(s) (if applicable) they had set for the race. For each goal that had been set, subjects then responded to the following four questions: Firstly, "Who set the goal" with the response scale ranging from 1 ("solely yourself") to 9 ("solely your coach") with the midpoint of 5 representing that the goal was equally agreed. Secondly, "How difficult do you think it will be to achieve the goal" on a scale from 1 ("extremely easy") to 9 ("extremely difficult"). Thirdly, "To what extent do you think you will achieve the goal?". The response scale ranged from -4 ("definitely no") to +4 ("definitely yes"), with the midpoint of 0 representing "uncertain". The last question asked about how important the goal was on a scale ranging from 1 ("not important at all") to 9 ("extremely important"). These questions were completed for each goal that had been set. Additionally, the subjects also responded to a question which asked how important the race was to the subject from 1 ("not important at all") to 9 ("extremely important").

6.424 Post-Race Goal Achievement Questionnaire

The post-race questionnaire which was completed following the competitive race was divided into three sections to correspond with the pre-race goal setting questionnaire. Specifically, within the outcome and process goal sections the subjects were asked if they had set a goal and if the goal was achieved in the race. In the performance goal section the subjects were asked these two questions, and if the time that they had achieved was a lifetime personal best, a season's best performance or neither of the two (see Appendix 19).

6.425 Social Validation Questionnaire

A social validation questionnaire was developed which incorporated specific, open-ended and Likert-type response questions and was divided into two separate parts. Part one included open-ended questions asking whether the subjects knew the purpose of the study, and why they were selected and asked to participate. Also included in this section were Likert-type responses on a 7 point scale ranging from 1 ("not at all") to 7 ("very much so") to questions which asked: if the subjects fully understood what was expected of them; if they adhered rigidly to the recommended order of practices in the study; how committed they were to the study; if they perceived that any performance
changes in swimming had occurred; and, if they considered the performance changes to be significant. Additionally, if the procedure was acceptable and useful to the subjects and if they would continue to practise any of the skills in the future. Part one of the questionnaire then referred back to open-ended questions examining if the subjects felt that they had benefited from the intervention and why. Furthermore, if they perceived that the intervention contributed to enhancing their performance, could they try and explain why. Part one was completed by responding to specific questions which asked how many times the imagery routines were practised, when in the day these sessions took place, and also when the physical warm-up was completed prior to the race.

The second part of the questionnaire (which was sealed in a separate envelope to be completed after the initial series of social validation questions) informed the subject what the aim of the study was and then asked the subjects if they perceived that cognitive and somatic anxiety intensity and direction levels, and self-confidence had altered throughout the study, and why they thought this was the case. Finally questions centred around goal setting, and if they now set goals differently following the intervention. (see Appendix 20).

6.43 STUDY DESIGN AND PROCEDURE

A single-subject multiple-baseline across-subjects design was adopted in this study. One subject (Subject 1), selected at random, acted as a control subject and did not receive the intervention programme. The intervention was introduced to Subjects 2, 3 and 4 after races 3, 4 and 5 (staggered baseline) respectively in the ten race series (see Figure 6.1). The decision to implement the treatment at the respective points in time was based on two factors; firstly, the stability of the direction scores, i.e., that the subjects remained clearly and consistently debilitative prior to the treatment phase; and secondly, to correspond with each subject's individual competition schedule. The baseline observations for three out of the four subjects were, therefore, those derived prior to the intervention treatment. Each subject completed the modified CSAI-2 and pre-race goal setting questionnaire within one hour prior to each of the ten competitive races. Following the event, the post-race goal setting questionnaire was completed. The specific procedures completed by the subjects were divided into four stages and are summarised in Figure 6.2. These stages included providing general information to the subjects, completing the intervention programme, collecting the social validation data, and finally, conducting a follow-up assessment after the completion of the study.
Figure 6.1  Staggered Single-Subject Multiple-Baseline Design Adopted in Study 4

Subject 1
No Intervention

Subject 2
Intervention

Subject 3
Intervention

Subject 4
Intervention

<table>
<thead>
<tr>
<th>Subject</th>
<th>Intervention</th>
<th>Baseline</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject 1</td>
<td>No Intervention</td>
<td>10 Races</td>
<td></td>
</tr>
<tr>
<td>Subject 2</td>
<td>Intervention</td>
<td>3 Races</td>
<td>7 Races</td>
</tr>
<tr>
<td>Subject 3</td>
<td>Intervention</td>
<td>4 Races</td>
<td>6 Races</td>
</tr>
<tr>
<td>Subject 4</td>
<td>Intervention</td>
<td>5 Races</td>
<td>5 Races</td>
</tr>
</tbody>
</table>
Figure 6.2 Flow Diagram of Study 4 Procedures for Intervention

Stage 1
PROVISION OF GENERAL INFORMATION

Stage 2
MULTIMODAL INTERVENTION PROGRAMME

Part 1
PRE-COMPETITION ROUTINE

- Goal Setting Education
- Mental Imagery

Part 2
PRE-RACE ROUTINE

- Decision Time
- Positive Thinking & Self-Talk
- Mental Imagery
- Self-Talk & Reminder Cue Cards
- Physical Warm-Up

Stage 3
COLLECTION OF SOCIAL VALIDATION DATA

Stage 4
FOLLOW-UP ASSESSMENT OF SUBJECTS
Stage 1: Provision of General Information to Subjects

Each of the subjects receiving the intervention treatment (i.e. Subjects 2, 3 and 4) were approached separately, and provided with general information about the study. The content was discussed until the subjects fully understood what was expected as a participant, and they were asked if they wished to continue as a subject. Also, any questions that the subjects raised were answered at this time. This initial meeting discussed the questionnaires in detail and their appropriate time for completion. It is important to highlight, that to avoid the possibility of respondent bias, the exact purpose of the study (to alter debilitative interpretations to facilitative interpretations of pre-race symptoms) was not discussed. The subjects were simply informed that they would be following some mental preparation strategies reported by a number of elite swimmers. The subjects were told that they would need to be committed to the study throughout the ten races and that the mental skills would require practise several times per week. Each subject was informed that an intervention would be implemented at some time over the course of the swimming season.

The control subject received similar information but was not informed of the intervention, and was asked to be a subject in a large data collection exercise.

Stage 2: Multimodal Intervention Programme

At the respective times in the stagger, the three swimmers selected to receive the treatment were asked if they wished to continue with the study, of which all three expressed that they did. The treatment, which was structured into two parts was then explained in detail to the three participating subjects. Specifically, the intervention incorporated two phases including a pre-competition routine to be practised in the days leading up to the race day, and a pre-race routine to be completed prior to each of the competitive races. The intervention was designed based on the information generated from the previous interview study with swimmers who interpreted pre-race thoughts and feelings as facilitative towards their upcoming races. For each strategy that was included in the intervention an accompanying footnote will highlight the appropriate higher order theme and general dimension from which the skill emanated from the previous study.

6.3 In order to standardise the information provided to the subjects, every effort was made to discuss and explain the procedures and content in the same amount of depth. Consequently, no subjects were provided with any more or any less information than others.

6.4 It should be highlighted that the intervention programme was provided for the control subject following the ten race series (see section 6.434).
6.43.21 Phase 1: Pre-Competition Routine

The pre-competition routine incorporated an educational goal setting session, and mental imagery sessions. The information was provided in written format which was also discussed between the researcher and the subject in order to ensure the subjects fully understood the requirements of this phase of the intervention.

6.43.21.1 Goal Setting Education Session

The aim of this session was to provide information on the practice of goal setting6.5, the principles of good goal setting practice, and the rationale behind the strategy. The different types of goals that can be set were then explained in detail (i.e. outcome, performance and process) to the subjects. It was stressed in this session that it is important to try and set intrapersonal goals, that is, goals that are internal and within the individual's control, such as the performance time and the race processes and not just outcome targets. The information provided for the subjects is presented in Appendix 21.

6.43.21.2 Mental Imagery

The second part of the pre-competition routine focused on the use of mental imagery routines. A detailed information package including imagery scripts and an audio tape were provided to efficiently guide the swimmers through the imagery sessions (see Appendix 22).

The instructions on a script are arguably the most important component of the imagery part of the intervention, and therefore, the imagery scripts and sessions were designed based on relevant imagery research discussed in the review of relevant literature. Specifically, the scripts included stimulus and response propositions, internal and external perspectives, different temporal aspects (fast and slow motion), physical simulation, and emphasis on vividness, controllability and successful execution of skills. The first section of the imagery training focused on rehearsing the typical thoughts and feelings experienced prior to a competitive race, and then rationalising these from a debilitative interpretation to a more facilitative perspective6.6. The session focused

6.5 Resulted from the higher-order theme of 'Goal Setting Strategies' in the general dimension of the 'Pre-Competition Routine' (Fig. 5.5). Additionally, the information provided to the subjects was based on the findings of the goal attainment expectancy study in Chapter 4 of this thesis.

6.6 Resulted from the higher-order sub-theme of 'Mental Imagery' in the general dimension of the 'Pre-Competition Routine' (Fig. 5.5). Specifically, this strategy was also based on the higher order theme of 'Rationalisation of Thoughts and Feelings' in the general dimension of the 'Pre-Race Routine' (Fig. 5.6a). Furthermore, although the elite swimmers rationalised their thoughts and feelings in the period preceding the race, it was considered necessary to simulate these and restructure them in the days leading up to competition via imagery training.
on how the thoughts and feelings are natural, can be enjoyed and actually work positively for performance.

The second section of the imagery training required mentally rehearsing race processes that are totally within the control of the subject. The final section involved repeating the mental rehearsal of the race processes but while actually in a pool training session, therefore providing a specific type of simulation training. It was recommended that the subjects practised these imagery skills a minimum of three times every week throughout the study.

6.4322 Phase 2: Pre-Race Routine

The pre-race routine was divided into a number of sections to be performed prior to each competitive race following the implementation of the intervention. The components of the routine were again discussed between the researcher and the subject and also summarised in written format (see Appendix 23). This routine was to be initiated approximately thirty minutes prior to the start of the race and included the following five parts:

6.43221 Decision Time

The pre-race routine started at an individual time when the swimmers decided for themselves that the time was right to become activated prior to the race. Prior to this time, it was recommended that the swimmers attempt to forget about the race via certain dissociation tactics such as taking themselves off somewhere cool away from the poolside.

6.43222 Positive Thinking and Self-Talk

The second part involved positive thinking and self-talk strategies, where the swimmers were advised to spend a few minutes thinking positively; for example, about previous good training sets and competitive races and congratulating themselves on these.

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6.7 Resulted from the higher order sub-theme of 'Concentrating on Race Process Goals' in the general dimension of the 'Pre-Race Routine' (Fig. 5.6c) which was also considered necessary to practise in the days leading up to the race.

6.8 Resulted from the higher order sub-theme of 'Training Imagery' in the general dimension of the 'Pre-Competition Routine' (Fig. 5.5).

6.9 Resulted from the higher-order sub-theme of 'Cognitive Activation and Arousal Control' in the general dimension of the 'Pre-Race Routine' (Fig. 5.6b).

6.10 Resulted from the higher-order theme of 'Dissociation Tactics' in the general dimension of the 'Pre-Race Routine' (Fig. 5.6c).
**6.43223 Imagery**

The pre-race imagery focused on a similar routine to the sessions completed in the pre-competition routine. Specifically, the imagery focused on two separate aspects of the upcoming swim; firstly, the race process goals\(^6.13\) (as practised in the dry land imagery session) such as performing efficient turns and stroke techniques; and secondly, imaging positive aspects of the race\(^6.14\) such as the feel and power of an efficient flowing stroke.

**6.43224 Self-Talk and Reminder Cue cards**

Following the imagery routine, part four of the pre-race routine focused once more on self-talk strategies. Specifically, the swimmers were advised to repeat to themselves phrases that rationalised their thoughts and feelings\(^6.15\) into a positive state during this period. These self-affirmation statements were written down on reminder cue cards and highlighted the need to accept and enjoy the symptoms and reiterated that the symptoms could work positively for the upcoming race (see Appendix 23).

**6.43225 Physical Warm-up**

Finally, the swimmers were advised to follow their usual flexibility and physical warm up routines\(^6.16\) prior to each competitive race. These exercises are typically performed almost continually after the water warm-up period, and were not advised to be performed following the previous four parts of the pre-race routine, but at any time the swimmer felt comfortable with.

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\(^6.11\) Resulted from the higher-order sub-theme of 'Positive Thinking' in the general dimension of the 'Pre-Race Routine' (Fig. 5.6b).

\(^6.12\) Resulted from the higher-order sub-theme 'Self-Talk' in the general dimension of the 'Pre-Race Routine' (Fig. 5.6b).

\(^6.13\) Resulted from the higher-order sub-theme of 'Concentrating on Race Process Goals' in the general dimension of the 'Pre-Race Routine' (Fig. 5.6c).

\(^6.14\) Resulted from the higher-order theme 'Positive Pre-Race Imagery' in the general dimension of the 'Pre-Race Routine' (Fig. 5.6c).

\(^6.15\) Resulted from the higher-order theme of 'Rationalisation of Thoughts and Feelings' in the general dimension of the 'Pre-Race Routine' (Fig. 5.6a).

\(^6.16\) Resulted from the higher-order theme of 'Physical Warm-Up Routine' in the general dimension of the 'Pre-Race Routine' (Fig. 5.6d).
6.433 Stage 3: Social Validation Data Collection

In addition to the general race information, CSAI-2 scores, and goal setting data, detailed supplementary information relating to the intervention programme was collected via the completion of a 'Social Validation Questionnaire' (see Appendix 20). Specifically, to investigate the subjects reactions to the actual content of the treatment and the procedures in the study. The three subjects who received the treatment were asked to complete this questionnaire at home 48 hours following the last race in the ten race series. The control subject was not requested to complete this questionnaire.

6.434 Stage 4: Follow-Up Assessment

In order to assess the retention effects of the intervention, the modified CSAI-2 would be completed by the three subjects who received the intervention prior to at least two competitive races after a four to five month period following the completion of the study. Furthermore, as highlighted in section 6.431, the control subject would be provided with the intervention treatment following the study, and therefore, state anxiety intensity and direction scores would be collected following the study. Responding to the lack of post-test assessments in intervention research, this stage of the study would establish if the desired behaviour changes were transitory or permanent.

6.44 DATA ANALYSIS

The analysis of the data was divided into four main stages. The first stage involved reporting the goal profile data for each subject. Specifically, the goals set for each of the ten races are presented, along with data reporting who set the goal, the difficulty level, perception of achievement, actual achievement and goal importance.

Secondly, detailed individual profiles of state intensity and direction scores from the modified CSAI-2 data are presented and examined across the ten separate competitive races in the study. The anxiety scores are, therefore, plotted separately for each of the four subjects.

The final two stages involved reporting the social validation data across the subjects who received the intervention, and finally presenting the CSAI-2 scores from the follow-up assessment of the subjects.

6.5 RESULTS

6.51 SUBJECT 1

Subject 1 was a 25 year old male who began competitive swimming at the age of ten, and has been competing in the sport for fifteen years. He is primarily a breaststroke
and butterfly specialist, but also competes at sprint freestyle and individual medley events. Subject 1 competes at all levels of competition from club and county standards, up to the district and national championships. Currently, Subject 1 completes, on average, six water training sessions per week which equates to approximately 12 water hours, and 35,000-45,000 metres in total distance. This training is supplemented with additional specific land sessions in the gymnasium. Subject 1 graduated from university with a B.Sc. (Hons) Economics in 1993 and is currently self employed.

Subject 1 acted as the control subject in the study and, therefore, did not receive the intervention treatment.

6.511 Goal Profile Data - Subject 1

Table 6.4 presents data from the pre-and post-race goal setting questionnaires completed by Subject 1 for each of the ten competitive races that were completed in the series. To restate, pre-race questions enquired about the importance of the race to the subject; the type of goals that may have been set; what each goal specifically was; who set the goal; the perceived difficulty level in achieving the goal; the extent the subject thought they could achieve the goal; whether the goal was achieved; and lastly, how important the goal was to the subject. Additional details of the column heading and table content items is provided in a 'table key' following the goal profile table.

6.5111 Race Importance

The possible response scale for this item ranged from 1 ("not at all important") to 9 ("extremely important"). Generally, all of the races that Subject 1 competed in were perceived as being important, with moderate to high scores in every case. The scores ranged from a low of '5' in Race number 8, to a high of '8' in three of the races (3, 4 & 10).

6.5112 Outcome Goals

An outcome (i.e. position) goal to finish first, was set in five of the ten races. Interestingly, an outcome goal was the only goal set in three of the races (Races 3, 7 & 10). These outcome goals were set solely by the subject in every race with the exception of Race 10, when the goal was equally agreed with the coach. The response scale for goal difficulty ranged from 1 ("extremely easy") to 9 ("extremely difficult"), and the subject responded with scores that ranged from '3' (Race 2), to a score of '7' in Race 5, which expressed that to win that race would have been considerably more difficult. The extent to which the subject thought he could achieve the positions he had set ranged from -4 ("definitely no") to +4 ("definitely yes").
<table>
<thead>
<tr>
<th>Race No.</th>
<th>Race Import</th>
<th>Type of Goal</th>
<th>Goal Set</th>
<th>Who Set</th>
<th>Goal Diffic</th>
<th>Percept Achieve</th>
<th>Actual Achieve</th>
<th>Goal Import</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6</td>
<td>Perform</td>
<td>SB</td>
<td>5</td>
<td>6</td>
<td>0</td>
<td>√</td>
<td>6</td>
</tr>
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<td></td>
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<td>√</td>
<td>4</td>
</tr>
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Table 6.4 Goal Profile Data for Subject 16.17

The key for Table 6.4 is presented overleaf on page 159.
## Key for Tables 6.4

### COLUMN HEADINGS

<table>
<thead>
<tr>
<th>Column Heading</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Race No.</td>
<td>The race number in the series of ten races</td>
</tr>
<tr>
<td>Race Import:</td>
<td>How important the subject perceived the race to be (from 1 “not at all” to 9 “extremely important”)</td>
</tr>
<tr>
<td>Type of Goal:</td>
<td>The types of goal set for the race (outcome, performance, process)</td>
</tr>
<tr>
<td>Goal Set:</td>
<td>The specific goal in each case (see below)</td>
</tr>
<tr>
<td>Who Set:</td>
<td>Who set the goal (from 1 &quot;solely yourself” to 5 &quot;equally agreed” to 9 &quot;solely your coach”)</td>
</tr>
<tr>
<td>Goal Diffic:</td>
<td>How difficult the subject perceived the goal to be prior to the race (from 1 &quot;extremely easy” to 9 &quot;extremely difficult”)</td>
</tr>
<tr>
<td>Percept Achieve:</td>
<td>The subject's pre-race expectation of achieving the goal (from -4 &quot;defiantly no” to 0 &quot;uncertain” to +4 &quot;definitely yes”)</td>
</tr>
<tr>
<td>Actual Achieve:</td>
<td>Whether the subject actually did achieve the goal in the race</td>
</tr>
<tr>
<td>Goal Import:</td>
<td>How important the subject perceived the goal to be (from 1 &quot;not at all” to 9 &quot;extremely important”)</td>
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### TABLE CONTENT

<table>
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<tr>
<th>Type</th>
<th>Description</th>
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<tr>
<td>Outcome:</td>
<td>Outcome (position) goal set</td>
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<tr>
<td>Perform:</td>
<td>Performance (time) goal set</td>
</tr>
<tr>
<td>Process:</td>
<td>Process goal (e.g. to achieve a fast start) set</td>
</tr>
<tr>
<td>1st:</td>
<td>Outcome goal set to win the race</td>
</tr>
<tr>
<td>Top 3:</td>
<td>Outcome goal set to achieve a top 3 position in the race</td>
</tr>
<tr>
<td>Top 6/8:</td>
<td>Outcome goal set to achieve a top 6 position in the race</td>
</tr>
<tr>
<td>SB:</td>
<td>Performance goal set to achieve a season’s best time</td>
</tr>
<tr>
<td>PB:</td>
<td>Performance goal set to achieve a personal best performance time</td>
</tr>
<tr>
<td>Specific:</td>
<td>Performance goal set to achieve a specific time</td>
</tr>
<tr>
<td>Start:</td>
<td>Process goal set to achieve a fast start in the race</td>
</tr>
<tr>
<td>Stroke:</td>
<td>Process goal set to achieve an efficient stroke technique in the race</td>
</tr>
<tr>
<td>Strategy:</td>
<td>Process goal set to achieve a certain strategy in the race</td>
</tr>
<tr>
<td>Turns:</td>
<td>Process goal set to achieve efficient turns in the race</td>
</tr>
<tr>
<td>√:</td>
<td>The goal was achieved</td>
</tr>
<tr>
<td>x</td>
<td>The goal was not achieved</td>
</tr>
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</table>
Again, responses were varied, ranging from negative or uncertain expectancies in Races 5 and 7, to a positive expectation of goal achievement in Races 2, 3 and 10. The goals were actually achieved in only two of the five races (2 & 7), the subject failing to win in Races 3, 5 and 10. Interestingly, the goal to win was perceived as extremely important for Subject 1, who registered a score of ‘8’ in three of the five races, and which was interpreted as the most important goal for that race.

6.5113 Performance Goals

A performance goal to achieve either a personal best (Races 4 & 8) or a season's best (Races 1 & 6) time was set in only four of the races. These goals were set equally with the coach in three of the four races. In Race 4, a score of ‘6’ indicated that the goal to achieve a personal best time was set marginally more by the coach than by Subject 1. Goal difficulty scores ranged from ‘5’ to ‘6’ which indicated perceptions of only moderate difficulty to achieve the performance times. Interestingly, each time a performance goal was set, Subject 1 held an uncertain expectation of achieving the goal, responding with a ‘0’ score in each instance. However, in three of the four races the target time was actually achieved with the exception of Race 4. The performance goal responses scored ‘6’ on the goal importance item in three of the four races, the other marginally higher with a response of ‘7’ in Race 8. Therefore, the time to be achieved was not considered as important as the outcome in the races to Subject 1.

6.5114 Process Goals

There was a higher preponderance of process goals set than either of the other two types of goal, with processes to concentrate on the turns (Races 1, 2, 4, 5 & 8) and stroke technique (Race 6) being set. Who set these process goals was divided equally between solely the swimmer (Races 2, 4 & 8) and equally agreed with the coach (Races 1, 5 & 6). Subject 1 perceived that these processes were not difficult to achieve and reported low goal difficulty scores of ‘4’, ‘3’, ‘5’, ‘4’, ‘5’ and ‘4’ respectively. A positive expectation to achieve these processes was expressed in five of the six races with the exception of Race 6, when the subject was uncertain of achieving an efficient stroke technique throughout the race. This positive expectation was not unfounded since the goal was achieved in four of the five races, the subject failing to achieve fast turns in Race 2. Despite the process goal being the most frequently set goal for this subject, it was not interpreted as important as either the performance goal or the most important outcome goals.
6.512 Modified CSAI-2 Scores Across the Ten Race Series for Subject 1

Figure 6.3 (a, b, c, d & e) illustrates the modified CSAI-2 scores recorded for Subject 1 for each competitive race in the ten race series. Specifically, cognitive anxiety intensity, somatic anxiety intensity and self-confidence scores are presented on a scale ranging from 9 to 33 (maximum possible range for the modified CSAI-2 intensity scale= 9 to 36). Cognitive anxiety direction and somatic anxiety direction scores are presented on a scale ranging from -19 to +15 (maximum possible range for the modified CSAI-2 direction scale= -27 to +27).

6.5121 Cognitive Anxiety Intensity

Figure 6.3a illustrates the cognitive anxiety intensity scores for Subject 1 throughout the study. The responses remained relatively stable throughout the ten races, with only a seven point fluctuation being evident throughout the entire series. Cognitive anxiety intensity scores ranged from a low of '17' (Race 3) to a high of '24' in Race 6. The stability of the responses is evident by comparing the first two scores of '20' and '18' with the last two scores of '20' and '19' illustrating minimal change in the level of cognitive anxiety throughout the study.

6.5122 Somatic Anxiety Intensity

Figure 6.3b illustrates the intensity scores for somatic anxiety in the study. Again, the responses show little variation, remaining stable throughout, with a five point fluctuation. Somatic anxiety was at its lowest in Race 5 with a score of '17', and reached its peak in Race 7, with a score of '22'. Furthermore, only a two point difference was evident between the first two data points with scores of '18' and '20' and the responses in the last two races of '18' and '20'.

6.5123 Self-Confidence

Self-confidence levels fluctuated slightly more than cognitive and somatic anxiety intensity in Subject 1, as illustrated in Figure 6.3c. The highest level of confidence was recorded in Races 4, 7 and 8, with scores of '24', '23' and '24' respectively. Self-confidence reached its lowest levels in Races 1, 9 and 10 with scores of '18', '16' and '18' respectively. Only a small difference was evident between the responses in first two races ('18' & '20') compared to the last two self-confidence responses ('16' & '18').

6.5124 Cognitive Anxiety Direction

Figure 6.3d illustrates the cognitive anxiety direction scores for Subject 1.
Figure 6.3 Modified CSAI-2 Scores Across the Ten Race Series for Subject 1

(a) Cognitive Anxiety Intensity

(b) Somatic Anxiety Intensity

(c) Self-Confidence

(d) Cognitive Anxiety Direction

(e) Somatic Anxiety Direction
The dotted horizontal line denotes the criterion above which facilitative scores are reported and below which debilitative scores are reported. Throughout the ten races, Subject 1 consistently reported debilitative interpretations of cognitive anxiety, with negative responses ranging from '-4' to '-2' in all but Races 3 and 7. In these two races, interpretations still failed to be facilitative with scores of '0' being reported, which denoted that the interpretation of cognitive anxiety was unimportant to the upcoming race. The examination of the first two and last two responses reiterates that cognitive anxiety remained debilitative throughout the study with scores of '-3' and '-2' for the first two races and '-3' and '-2' for the latter two races.

**6.525 Somatic Anxiety Direction**

A similar general trend of results was evident for somatic anxiety direction in Subject 1, as shown in Figure 6.3e. Debilitative scores were reported in eight of the ten races, with Races 4 and 5 being interpreted as unimportant with '0' scores from Subject 1. Somatic anxiety was perceived as slightly more debilitative than cognitive anxiety, as the scores ranged from '-9' in Race 7, to '-2' in Race 2. As was the case for cognitive direction little variation was evident between the first and last two responses with '-3' and '-2' scores being reported for the first two races and '-5' and '-3' for Races 9 and 10.

**6.52 SUBJECT 2**

Subject 2 was a 20 year old male who started competitive swimming at the age of eight and has been competing in the sport for twelve years. He is primarily a sprint backstroke specialist (50 & 100 metres), but additionally competes at sprint and middle distance freestyle, individual medley and occasionally butterfly events. Subject 2 competes at club, county and district standards. He also competed and qualified for the national student long (50 metre) and short (25 metre) course championships. Currently, Subject 2 completes, on average, seven to eight water training sessions per week which equates to approximately 12-14 water hours, covering up to 42,000 metres each week. At least 4-5 hours of this training is completed in early morning training sessions. Water training is supplemented with additional weight training sessions approximately three or four times each week. Subject 2 is currently a second year undergraduate student reading European Studies. The intervention programme was initiated with this subject immediately after Race 3.

**6.521 Goal Profile Data - Subject 2**

Table 6.5 presents data collected from the pre-and post-race goal setting questionnaires completed by Subject 2 for each of the ten races in the study series.
### Table 6.5  
Goal Profile Data for Subject 26.18

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<th>Percept Achieve</th>
<th>Actual Achieve</th>
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6.18 The key for Table 6.5 is presented on page 159.
6.5211 Race Importance

Every race in the series, with the exception of Race 1 (scoring a low '3') was perceived as important to Subject 2. Indeed, four of the races post-intervention scored a maximum '9', indicating the races (6, 7, 9 & 10) were "extremely important" to the subject.

6.5212 Outcome Goals

An outcome goal was set in two of the three pre-intervention races, and three out of the seven possible post-intervention races. There was no distinction between pre-intervention and post-intervention as to what these outcome goals were for the races, or who set the goals. In all five instances, Subject 3 set the goal to finish the race in the top three positions solely on his own. Pre-intervention goal difficulty responses scored '6' and '7', indicating that the subject thought the outcome goals were difficult. Following the intervention the outcome goals were also perceived as difficult, with responses of '7', '8' and '7' (Races 4, 9, & 10) respectively being recorded. A distinction was evident between the two phases of the study in relation to the degree the subject expected to achieve the goal. The questionnaire item enquired about the pre-race expectation of achieving the goal on a scale from -4 ("definitely no") to 0 ("uncertain") to +4 ("definitely yes"). Prior to the intervention both of the two outcome goals that were set scored '-2', which indicated a negative expectation of goal achievement. Post-intervention, initially a top three position in Race 4 was not expected ('-1'); however, by Races 9 and 10 there was a positive expectation of achieving the positions that had been set. Regarding actual achievement of these goals, pre-intervention, Subject 4 failed to finish in the top three in either of the races. Post-intervention, this was also the case in Race 10, but encouragingly in Races 4 and 9 the goal was achieved. The importance of the goal also varied slightly with pre-intervention scores of '6' and post-intervention scores of '8' in each case which indicated that the outcome became more important to the subject following the intervention.

6.5213 Performance Goals

A performance goal was set in all ten races by Subject 2. The performance goals set prior to the intervention did differ to a degree to the times the subject wanted to achieve following the intervention. Pre-intervention, the goal was either to swim a season's best time (Race 1), or a specific performance time (Races 2 & 3). These specific times for example, were to swim a solid performance time of under 63 seconds for the 100 metre backstroke. Post-intervention, the first two races (Races 4 & 5) continued to set these types of performance goals. However, from Race 6 onwards, Subject 2 aimed
to achieve a personal best time in every race. In the pre-intervention phase the subject set the performance goals solely on his own; however, following the intervention the goals tended to be equally agreed with the coach. Only in Races 6 and 8 did the subject set the time goal on his own. The difficulty level of the goals differed very slightly pre to post-intervention, with average difficulty scores of '5', '6' and '4' pre-intervention, which became marginally more difficult following the intervention, with scores of '7' being registered towards the end of the study. Replicating the findings from the outcome goals, there was an encouraging distinction between the two phases on the subject's expectation of achieving the performance goals. Pre-intervention, the expectation of goal achievement was either negative (Race 1), or uncertain (Races 2 & 3). Post-intervention the subject expected to achieve the time goals that had been set in every instance with the most positive expectations of '+3' in races 4 and 9. Subject 2 failed to achieve any of the performance times that were set pre-intervention; however, in the post-intervention phase all the performance times were achieved without exception. The subject therefore achieving new personal best times in last four races. The performance goals that were set did become more important to the subject following the intervention, with maximum responses of '9' ("extremely important") being registered in Races 6, 7, 9 and 10. These goals were therefore more important than the outcome goals to Subject 2, not only in the importance score but also in the fact that a performance goal was set in all of the races.

6.5214 Process Goals

No process goals were set prior to the intervention. However, following the treatment, process goals to achieve either an efficient stroke technique or fast turns were set in all the remaining races. All of the process goals set were equally agreed with the coach, and carried moderate to high difficulty levels with typical responses of '5' and '6' and '7' in Race 10 being reported. Subject 2 held a positive expectation of achieving the processes, and perceived that he did achieve the goals. The importance of the process goals increased with each race post-intervention, with scores of '4', '5', '6', '7', '7', '8' and '8' respectively being reported. These goals were perceived as very important but marginally less important than the performance goals which registered maximum responses.

6.522 Modified CSAI-2 Scores Across the Ten Race Series for Subject 2

Figure 6.4 (a, b, c, d & e) illustrates the modified CSAI-2 scores recorded for Subject 2 for each competitive race in the ten race series.
6.5221 **Cognitive Anxiety Intensity**

Figure 6.4a illustrates the effects of the intervention on the cognitive anxiety intensity levels for Subject 2, where the responses remained stable throughout the series. Prior to the intervention, implemented after Race 3, the intensity scores ranged from a low of '25', to a high of '27'. Post-intervention, the scores ranged from '24' in Races 6, 9 and 10, to a high of '27' in Races 4, 5 and 7. A comparison of the mean values indicated a slight decrease post-intervention with a mean of 25.57 from the pre-intervention mean of 26. However, the overall trend remained stable. The number of overlapping data points was high, with the scores in Races 2 and 3 being replicated following the intervention.

6.5222 **Somatic Anxiety Intensity**

Figure 6.4b represents the intervention effects on the intensity of the somatic anxiety subcomponent in Subject 2. As was the case for cognitive anxiety intensity, the scores remained relatively stable throughout the series, with only minimal fluctuation. Pre-intervention, the scores ranged from '17' to '19', and post-intervention the range was marginally higher, from a low of '17' to a high of '21'. Again, two overlapping data points are evident pre to post-intervention, with Races 1 and 4 scoring '17', and Races 3 and 5 both scoring '19'. Examining the mean values, it was evident that somatic anxiety intensity increased very slightly from a mean of 18.0 pre-intervention, to 19.86 following the intervention.

6.5223 **Self-Confidence**

Figure 6.4c shows the effects of the intervention on the self confidence subcomponent in Subject 2. The general trend over all 10 races in the series revealed fluctuation in the range of scores. Pre-intervention scores ranged from a low of '12', to a high of '18', and post intervention scores ranged from a low of '19' to a high of '23'. Following the treatment, self-confidence increased significantly from a mean of 16.0 in the pre-intervention phase, to 21.14 following the intervention, and there were no overlapping data points between the two phases.

6.5224 **Cognitive Anxiety Direction**

Figure 6.4d presents the effects of the intervention on cognitive anxiety direction for Subject 2. Prior to the intervention, Subject 2 interpreted cognitive anxiety as clearly and consistently debilitative. Scores ranged from a low of '-16' in Race 2, to '-7' in Race 1. Immediately following the intervention, Subject 2 reported a debilitative response, but only slightly, with a score of '-1'. From there on, Subject 2 interpreted cognitive anxiety symptoms as facilitative.
Figure 6.4 Modified CSAI-2 Scores Across the Ten Race Series for Subject 2

(a) Cognitive Anxiety Intensity

(b) Somatic Anxiety Intensity

(c) Self-Confidence

(d) Cognitive Anxiety Direction

(e) Somatic Anxiety Direction
Indeed, positive interpretations were reported in all remaining races with scores of '+10', '+9', '+8', '+8', and '+9' respectively. No overlapping data points were evident between the pre-intervention series of races and the post-intervention races. All of the direction scores following the intervention were more facilitative than prior to the intervention. Before the intervention, the mean response score of -10.67 was clearly debilitative; however, post-intervention, a mean of +6.43 represented a significant alteration of the subject's interpretation of cognitive anxiety.

6.525 Somatic Anxiety Direction

The effects of the intervention of the directional perceptions of somatic anxiety symptoms are represented in Figure 6.4e. A similar pattern of results to cognitive anxiety direction was reported, with pre-intervention scores being interpreted as debilitative, and post-intervention scores which gradually became more facilitative. Prior to the intervention the interpretation of somatic anxiety symptoms was reported as debilitative, but not to the same extent as cognitive anxiety, with scores of '-3', '-2' and '-1' respectively being presented. Following the intervention, the interpretation of somatic symptoms in Race 4 was reported as unimportant, but thereafter Subject 2 interpreted the symptoms as facilitative towards his upcoming races. Post-intervention, facilitative scores ranged from '+2', to a high of '+8' in the final race. There were no overlapping data points between the first three races and the last seven races. The mean scores indicated that Subject 2 progressed from a mean debilitative interpretation of -2 pre-intervention, to a facilitative +4.29 following the intervention.

6.53 Subject 3

Subject 3 was a 21 year old male who started competitive swimming at the age of eight and has been competing in the sport for twelve years. He is primarily a sprint and middle distance freestyle swimmer but regularly competes at the individual medley events and is a high standard four stroke swimmer. Subject 3 competes at club, county and district standards and also competed and qualified for the national student championships. Currently, Subject 3 completes, on average, ten water training sessions per week which equates to approximately 16-18 water hours, covering up to 55,000 metres each week. As with Subject 2, at least 4-5 hours of this training is completed in early morning training sessions which start at 5.00 am. Water training is supplemented with additional weight training sessions approximately twice every week. Subject 3 is currently a final year undergraduate student studying Physical Education, Sports Science and Physics. Subject 3 started the intervention programme immediately after Race 4 in the study programme.
6.531 Goal Profile Data - Subject 3

Table 6.6 presents data collected from the pre-and post race goal setting questionnaires completed by Subject 3.

6.5311 Race Importance

All of the races in the study series were perceived as important to Subject 3, both pre-intervention and post-intervention. The latter races all scored the highest rating of '9' with a slightly lesser importance being placed on Races 1, 4, 5 and 6, which still scored an importance of '7'.

6.5312 Outcome Goals

Outcome goals were set in three of the four pre-intervention races, and three of the six post-intervention races. The goals set in both phases were to finish in the top three in each competitive race. Who actually set the goal tended to vary between solely the subject (Races 1 and 10), to solely the coach (Race 3) and was also equally agreed between coach and swimmer in Races 4 and 5. Each time an outcome goal was set, Subject 3 perceived it as moderate to high in its difficulty level, as the responses ranged between '6' and '7', with no obvious difference following the intervention. Interestingly, the extent to which the subject thought he could achieve the goal in the pre-intervention phase tended to be either negative or uncertain, with only one of the three outcome goals actually being achieved. However, following the intervention, Subject 3 held much more positive expectations of goal achievement, and did achieve the top three position desired in each case. A difference also emerged after the intervention relating to the importance of the goal. Specifically, Subject 3 attached less importance to the position in the race following the intervention.

6.5313 Performance Goals

A performance time goal was set in all ten races by Subject 3, with a season's best time set as the typical goal in the pre-intervention phase, and a greater preponderance of personal best times following the intervention. Pre-intervention, Subject 3 tended to set the performance goals solely on his own. The trend was the same following the intervention; however, in Races 7 and 10 the time to be achieved was equally agreed with the coach. Goal difficulty scores showed variation in both pre-intervention and post-intervention phases, with the last two races holding a maximum difficulty score of '9', where the goal was to achieve a personal best time.
Table 6.6  Goal Profile Data for Subject 36.19

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* Intervention *

| 5        | 7           | Outcome      | Top 3    | 1       | 8           | 2              | √             | 7           |
|          |             | Perform      | SB       | 1       | 6           | 2              | √             | 8           |
|          |             | Process      | Stroke   | 1       | 5           | 2              | √             | 9           |
| 6        | 7           | Perform      | SB       | 1       | 7           | 1              | √             | 7           |
|          |             | Process      | Stroke   | 1       | 5           | 2              | √             | 8           |
| 7        | 9           | Outcome      | Top 3    | 1       | 7           | 3              | √             | 5           |
|          |             | Perform      | PB       | 1       | 7           | 2              | √             | 9           |
|          |             | Process      | Stroke   | 1       | 7           | 2              | √             | 7           |
| 8        | 8           | Perform      | PB       | 1       | 7           | 2              | √             | 9           |
|          |             | Process      | Turns    | 1       | 7           | 2              | √             | 7           |
| 9        | 9           | Perform      | PB       | 1       | 9           | 1              | √             | 9           |
|          |             | Process      | Strategy  | 1       | 9           | 1              | √             | 9           |
| 10       | 9           | Outcome      | Top 3    | 1       | 6           | 2              | √             | 5           |
|          |             | Perform      | PB       | 1       | 9           | 2              | √             | 9           |
|          |             | Process      | Stroke   | 1       | 8           | 0              | √             | 7           |

6.19 The key for Table 6.6 is presented on page 159.
As was the case for outcome goals in the pre-intervention races, Subject 3 held a negative or uncertain expectation of goal achievement with the exception of the first race of the season. Interestingly, however, the goal was achieved in each case. Post-intervention, a positive expectation of goal achievement was evident in every case where the subject continued the trend of achieving the goals. Finally, the performance goals increased in importance following the intervention, with a maximum score being reported in four of the six post-intervention races.

6.5314 Process Goals

Process goals were also set in all of the races in the series. All four pre-intervention races reported a stroke-related process as the goal, such as to concentrate on the stroke efficiently in the latter half of the race. Following the intervention, a stroke-related process was again set for the first three and last race of the series. A different process became the goal in Races 8 and 9, with efficient turns and an even splitting strategy being the target. In the first four races, Subject 4 set the process goals himself which supported the trend in the second six races, with the exception of Races 7 and 10 when the process was equally agreed with the coach. The difficulty of the process goals showed no discernible difference pre-intervention to post-intervention, with scores ranging between '5' and 7 pre-intervention and '5' and '8' post-intervention. Throughout the study, Subject 3 held favourable expectations of achieving process goals, with slightly more favourable expectations being reported following the intervention. This was with the exception of the final race which reported an uncertain expectancy score. Subject 3 achieved two out of four process goals prior to the intervention and all six goals following the treatment. Excluding the first two races in the series, the importance of the process goals ranged from '7' to '9' throughout the last eight races, with no salient difference pre to post-intervention.

6.532 Modified CSAI-2 Scores Across the Ten Race Series for Subject 3

Figure 6.5 (a, b, c, d & e) shows the intensity and direction scores across the ten races for Subject 3.

6.5321 Cognitive Anxiety Intensity

Figure 6.5a shows the effects of the intervention on the cognitive anxiety intensity levels of Subject 3 where responses displayed little variation throughout the ten races. Prior to the intervention intensity scores ranged from a low of '21' (Races 1, 2 & 4) to a high of '24' (Race 3). Following the treatment, the general trend illustrated a slight
decrease towards the final races of the study. A comparison of mean values indicated that cognitive anxiety intensity scores decreased marginally from 21.75 in the pre-intervention phase, to 19 following the intervention. The number of overlapping data points was relatively high, with the first two races following the intervention scoring the same as the three races prior to the intervention.

6.5322 Somatic Anxiety Intensity

Figure 6.5b illustrates the intervention effects on the intensity score of the somatic anxiety subcomponent. Overall, the intensity responses tended to fluctuate, with the scores prior to the intervention varying from a low of '17' to a high of '24'. Post-intervention scores ranged from a very low score of '10', to a relatively high score of '25'. As was the case for cognitive anxiety intensity, there was also an instance of overlapping data with the response score of '19' for Race 7 post-intervention replicating Race 1 pre-intervention. Overall, somatic anxiety intensity scores decreased marginally from 20.5 (pre-intervention) to 19.33 (post-intervention).

6.5323 Self-Confidence

Figure 6.5c shows the intervention effects on the level of self-confidence in Subject 3. Confidence levels prior to the intervention, and the two races immediately post-intervention, displayed minimal fluctuation with low scores which ranging from '11' to '13'. Following the treatment, there were no initial signs of improvement in confidence levels over the first two races, with the scores in Races 5 and 6 overlapping with the score in Race 4. However, following Race 6, there was a dramatic increase in the level of confidence, with scores of '23' and '24' being reported in the remaining four races. Self-confidence scores increased from 12.25 (pre-intervention) to 20.33 (post-intervention).

6.5324 Cognitive Anxiety Direction

Figure 6.5d presents the effects of the intervention on the directional perceptions of cognitive anxiety for Subject 3. All directional interpretations of cognitive anxiety symptoms prior to the intervention remained clearly debilitative, with scores ranging from a low of '-10' (Race 3) to a high of '-4' (Race 4). Following the intervention, the general trend demonstrated a gradual increase towards interpreting cognitive anxiety as facilitative. Specifically, only one data point scored below zero ('-1' in Race 5) which was the race immediately following the intervention. The breakthrough into facilitation occurred at Race 6 which showed a gradual increase with a score of '+1'.
Figure 6.5  Modified CSAI-2 Scores Across the Ten Race Series for Subject 3

(a) Cognitive Anxiety Intensity

(b) Somatic Anxiety Intensity

(c) Self-Confidence

(d) Cognitive Anxiety Direction

(e) Somatic Anxiety Direction
The direction scores in races seven to ten were all clearly facilitative ranging from '+11' to '+14'. There were no overlapping data points between the pre-intervention and post-intervention phases on cognitive anxiety direction. All scores in the post intervention phase were greater and therefore more facilitative than those in the pre-intervention. Cognitive anxiety direction scores increased from -6.75 before the treatment to +8.17 following the intervention.

6.5325 Somatic Anxiety Direction

Figure 6.5e presents the intervention effects for Subject 3 on the directional perceptions of somatic anxiety. Prior to the intervention, as was the case with cognitive anxiety, all direction scores remained clearly debilitative with responses ranging from '-12' to '-3'. Post-intervention, the general trend again demonstrated a gradual increase towards interpreting somatic anxiety as facilitative. Race 5, following the intervention, emerged as still slightly debilitative with a score of '-1'. However, thereafter scores became gradually more facilitative and reached a high of '+13' in the penultimate race. As in the case of cognitive anxiety direction there were no overlapping data points between the pre-intervention and post-intervention phases. Pre-intervention to post-intervention scores increased for somatic anxiety direction from -6.75 to +6.5 respectively.

6.54 SUBJECT 4

Subject 4 was a 21 year old male who started competitive swimming at the age of seven and has actually been competing in the sport for ten years. Subject 4 is a 100 and 200 metre breaststroke specialist, but also competes at the sprint breaststroke and occasionally at the individual medley events. Subject 4 competes at all competitive standards from club, county, district and national championships. Currently, Subject 4 completes eight training sessions on average in the pool each week which equates to approximately 14 water hours, covering up to 40,000 metres each week. As with Subjects 2 & 3, at least 4-5 hours of this training is completed in early morning training sessions which start at 5.00 am. Water training is supplemented with additional weight training sessions approximately twice every week. Subject 4 is currently a final year undergraduate student reading Business Studies. Subject 4 started the intervention programme immediately after Race 5 in the series of ten races.

6.541 Goal Profile Data - Subject 4

Table 6.6 presents data collected from the pre-and post-race goal setting questionnaires completed by Subject 4.
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6.20 The key for Table 6.7 is presented on page 159.
6.5411 Race Importance

Supporting the responses of the previous subjects, all races were perceived as important to Subject 4 in both the pre-intervention and post-intervention phases. Pre-intervention race importance scores ranged from '6' in Race 2 to '8' in Race 3. Following the intervention, Races 6 and 8 were perceived as the least important, the most important race being number 10, with a score of '8'.

6.5412 Outcome Goals

An outcome goal to achieve a top eight position and qualify for a final event was the only outcome goal set prior to the intervention (Race 2). The target was set solely by Subject 4, perceived as being very difficult with a score of '8', and was not expected to be achieved with a negative expectation score of '-2'. Somewhat predictably, the goal was not achieved, and only carried an importance score of '4' which indicated below average importance. Following the intervention, an outcome goal was set in four of the five remaining races, which included the goal to achieve a top 16 position (consolation final place), and top three position goals. All four outcome goals were set solely by the subject without consultation with the coach. The goals set in Races 6, 8 and 9 all carried difficulty levels of '8' or '9'; however, the outcome goal in Race 10 was interpreted as being less difficult with a score of '5'. Interestingly, the three goals perceived as very difficult were not expected to be achieved by Subject 4, both with a negative expectation score '-2' being reported. The final race was the only event where a positive expectation of goal achievement was reported. None of the first three outcome goals set were actually achieved in the races, the exception being the fourth goal set in Race 10, were a top three position was achieved. The outcome goals that were set by Subject 4 were not perceived as being important with two low scores of '2', and two scores of '4' being reported.

6.5413 Performance Goals

Replicating the findings from the previous subjects, a performance goal was set in all ten races in the study series. Prior to the intervention, Subject 4 set all the performance goals solely on his own, with the specific race targets or season's best times being set as the goals. Post-intervention, the times were set solely by the subject, once more to achieve one season's best, three specific target times and one personal best performance time. The range of scores for goal difficulty revealed much fluctuation, from a low of '1' in Race 5, to a high of '8' in Race 9 in the post-intervention phase. The times to be achieved in Races 1, 2 and 3 were perceived as being relatively difficult. However, the
goal times in the last two races before the intervention were perceived as being easier to achieve. Post-intervention, four of the five times to be achieved were perceived as being difficult with responses of '7' or '8', the exception occurring in Race 8, with a difficulty score of '4'. A negative or uncertain expectation of goal achievement was evident in four of the races before the intervention, with the exception of Race 5, where a positive expectation was reported. This was not surprising because the goal was interpreted as extremely easy to achieve by Subject 4. Following the intervention, the first three races carried a positive expectation of goal achievement, but in the last two races Subject 4 was uncertain of his ability to achieve the goal. Two of the goal times that were set were achieved before the intervention in Races 4 and 5. Post-intervention, the times were achieved in all races with the exception of Race 9, which did carry an uncertain expectation and high goal difficulty. All performance goals, pre and post-intervention were perceived as being significantly more important than the outcome goals with the lowest goal importance score being registered in Race 5. There were no distinctions between the two phases on the perception of how important the time goals were to the individual.

6.54.14 Process Goals

Replicating the goal setting strategy of Subject 2, no process goals were set before the intervention was implemented, but after the intervention a process goal was set in every race. From Race 6 onwards, two different process goals were set to achieve efficient turns and adopt a specific race strategy. As with all the goals set by this subject, these were set solely by the individual without any external influence of the coach. The difficulty level of these processes ranged from a score of '4' in Race 7 to a score of '7' in the last race. Subject 4 held a positive expectation of achieving these goals in the first three races following the intervention; however, in the last two races he was uncertain of his ability to adopt the correct strategy. Three of the five process goals that were set were actually achieved, the process goals that were not achieved being in Races 6 and 9. Interestingly, when the subject started to set process goals, these became the most important race goals, more important than both the outcome and the performance goals. Indeed, a maximum goal importance score of '9' was registered in Races 6 and 10.

6.54.2 Modified CSAI-2 Scores Across the Ten Race Series for Subject 4

Figure 6.6 (a, b, c, d & e) illustrates the modified CSAI-2 scores recorded for Subject 4 for each competitive race in the ten race series.
**6.5421 Cognitive Anxiety Intensity**

Figure 6.6a illustrates the cognitive anxiety intensity scores for Subject 4. With the exception of Race 3 in the pre-intervention phase, and Race 10 in the post-intervention phase, the responses remained relatively stable throughout. The mean score for the pre-intervention phase was 21.4, and 20.6 for the latter five races. In the first five races, intensity levels ranged from a low of '18' to a peak of '27' in the third race. The first four races following the intervention ranged in intensity level by only one point, with the post intervention peak intensity occurring in the last race with a score of '24'. The number of overlapping data points was high with a score of '20' being reported in five of the ten races.

**6.5422 Somatic Anxiety Intensity**

The effects of the intervention on somatic anxiety intensity in Subject 4 are illustrated in Figure 6.6b. The scores remained extremely stable throughout the ten race series. The mean score prior to the intervention was 17.8 rising by only 0.4 to 18.2 after the intervention. There was only a two point range in response scores prior to the intervention, and only a three point variation following the intervention. The number of overlapping data points, as was the case of cognitive anxiety intensity was high with scores of '17' and '18' in the pre-intervention phase also being replicated after the intervention.

**6.5423 Self-Confidence**

Figure 6.6c shows the effects of the intervention of the level of self-confidence. Supporting the results of the previous two subjects, the level of confidence did increase after the intervention was implemented. Examination of the mean scores supports this, with the post-intervention mean of 22.4 approximately four points higher than the pre-intervention mean of 18.6. In the first five races confidence levels ranged from a low '14' in Race 3, to a high of '24' in the last race before the intervention started. In Races 5 to 10, the lowest reported confidence score was '20' rising to '25' in Race 8. There was only one overlapping data point between the two phases, with the response score of '24' being reported in Race 5 before the intervention and Race 9 after the intervention.

**6.5424 Cognitive Anxiety Direction**

The effect of the intervention on the direction of cognitive anxiety for Subject 4 also supports the findings from the previous subjects on this component (Figure 6.6d).
Figure 6.6  Modified CSAI-2 Scores Across the Ten Race Series for Subject 4

(a) Cognitive Anxiety Intensity

(b) Somatic Anxiety Intensity

(c) Self-Confidence

(d) Cognitive Anxiety Direction

(e) Somatic Anxiety Direction
All of the interpretations of cognitive anxiety before the intervention were debilitative, and ranged from a low of '-10' in the third race to a high of '-1' in the race preceding the intervention, with a mean score for this phase of -3.8. Following the intervention, all interpretations were facilitative, with a mean of +2; however, the magnitude of facilitation was not as great as for previous subjects, with responses of '+3', '+1', '+2', '+3' and '+1' respectively. There were no overlapping data points between the two phases.

6.5425 Somatic Anxiety Direction

A similar trend of results for somatic anxiety direction was evident for Subject 4 in Figure 6.6e. All interpretations of the somatic symptoms before the intervention were debilitative, with the exception of Race 4 where he interpreted these physical symptoms as unimportant towards his upcoming performance. Pre-intervention scores therefore ranged from '-5' to '0', with a mean of -2.4. As was the case of cognitive anxiety direction, all post-intervention scores were facilitative, with a slightly greater magnitude for somatic anxiety than for cognitive anxiety. Scores ranged from '+2' to '+6' with a mean for the five races of +3.8 and no overlapping data points were evident.

6.55 Modified CSAI-2 Data Summary

Table 6.8 illustrates the pre-intervention and post-intervention means and standard deviations of all of the CSAI-2 intensity and direction scores for the subjects involved in the study. For the purpose of comparison, mean scores for the first five and second five races for Subject 1 who did not receive the intervention treatment, are presented. Observation of the mean scores reveals that Subject 1 remained clearly debilitative for both cognitive and somatic anxiety throughout the study. Also, the levels of cognitive and somatic anxiety, and self-confidence remained stable. For Subjects 2, 3 and 4, the post-intervention scores for pre-race cognitive and somatic anxiety direction show considerably more facilitative interpretations following the intervention, which was also accompanied by an increase in self-confidence. This evidence of the success of the intervention treatment is apparent, particularly in view of the fact that the intensity scores for cognitive and somatic anxiety remained stable between the pre-intervention and post-intervention phases.
Table 6.8 Means and Standard Deviations for Pre-Intervention and Post-Intervention CSAI-2 Scores

<table>
<thead>
<tr>
<th>Subscale</th>
<th>S1 1st 5 Races</th>
<th>S1 2nd 5 Races</th>
<th>S2 Pre</th>
<th>S2 Post</th>
<th>S3 Pre</th>
<th>S3 Post</th>
<th>S4 Pre</th>
<th>S4 Post</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAI Mean</td>
<td>18.8</td>
<td>20.8</td>
<td>26.0</td>
<td>25.57</td>
<td>21.75</td>
<td>19.0</td>
<td>21.4</td>
<td>20.6</td>
</tr>
<tr>
<td>SD</td>
<td>(1.3)</td>
<td>(1.92)</td>
<td>(1.0)</td>
<td>(1.51)</td>
<td>(1.5)</td>
<td>(2.0)</td>
<td>(3.46)</td>
<td>(1.95)</td>
</tr>
<tr>
<td>SAI Mean</td>
<td>19.0</td>
<td>20.4</td>
<td>18.0</td>
<td>19.86</td>
<td>20.5</td>
<td>19.33</td>
<td>17.8</td>
<td>18.2</td>
</tr>
<tr>
<td>SD</td>
<td>(1.58)</td>
<td>(1.82)</td>
<td>(1.0)</td>
<td>(1.46)</td>
<td>(3.11)</td>
<td>(5.24)</td>
<td>(0.84)</td>
<td>(1.10)</td>
</tr>
<tr>
<td>SC Mean</td>
<td>20.6</td>
<td>20.2</td>
<td>16.0</td>
<td>21.14</td>
<td>12.25</td>
<td>20.33</td>
<td>18.6</td>
<td>22.4</td>
</tr>
<tr>
<td>SD</td>
<td>(2.19)</td>
<td>(3.45)</td>
<td>(3.46)</td>
<td>(1.46)</td>
<td>(0.96)</td>
<td>(5.75)</td>
<td>(3.72)</td>
<td>(2.07)</td>
</tr>
<tr>
<td>CAD Mean</td>
<td>-2.0</td>
<td>-2.4</td>
<td>-10.67</td>
<td>+6.43</td>
<td>-6.75</td>
<td>+8.17</td>
<td>-3.8</td>
<td>+2.0</td>
</tr>
<tr>
<td>SD</td>
<td>(1.23)</td>
<td>(1.52)</td>
<td>(4.73)</td>
<td>(4.13)</td>
<td>(2.5)</td>
<td>(6.75)</td>
<td>(3.63)</td>
<td>(1.0)</td>
</tr>
<tr>
<td>SAD Mean</td>
<td>-1.6</td>
<td>-6.2</td>
<td>-2.0</td>
<td>+4.29</td>
<td>-6.75</td>
<td>+6.5</td>
<td>-2.4</td>
<td>+3.8</td>
</tr>
<tr>
<td>SD</td>
<td>(1.52)</td>
<td>(2.39)</td>
<td>(1.0)</td>
<td>(2.63)</td>
<td>(3.86)</td>
<td>(4.89)</td>
<td>(1.82)</td>
<td>(1.79)</td>
</tr>
</tbody>
</table>

6.56 SOCIAL VALIDATION DATA

The following section presents data from the social validation questionnaire where quotations from the responses will be followed by the relevant subject number in an attempt to facilitate the understanding and explanation of the study findings. The questionnaire was divided into two separate parts which were completed separately.

6.561 Part 1

The responses to the initial open-ended questions enquired about what the purpose of the study was. All three of the subjects indicated that they thought that they knew what the purpose was. However, when asked to elaborate in their own words, the responses varied considerably. The responses were: "To improve pre-race imagery techniques and to try and alter my pre-race thoughts" (2); "To improve thoughts before the race and to try and convert negative thoughts into positive ones" (3); "To change the way that I think about the feelings that arise before a race and then learn how to manipulate them to work in your favour " (4).
Secondly, answers to the question which asked if it had occurred to the subjects why that were selected for the study ranged from a brief "not really" (4); and "perhaps I have a lot of negative thoughts" (3); to a more detailed account of: "I qualified for the study as I am a subject who has not experienced this approach to pre-race preparation and therefore can improve my own ability by using the techniques" (2).

In response to the series of questions which adopted a seven point Likert-type scale, where responses ranged from 1 ("not at all") to 7 ("very much so"), the subjects firstly indicated that they all fully understood what was expected of them in the study, two subjects responding with the maximum score of '7', with the other subject reporting a score of '6'. In response to sticking rigidly to the order of practices and recommendations in the study, two of the subjects again reported a maximum value of '7' with the other subject stating a value of '5'. Regarding commitment to the study two subjects responded with a '6', the other claiming maximum commitment with a score of '7'.

All the subjects perceived that there had been swimming performance changes (i.e. that they had performed to a higher standard) throughout the study, and responded with scores of '7', '7' and '6' respectively. This was supported by the next scale which asked if these performance changes were considered to be significant with responses of '6', '6' and '7' with '7' representing the anchor of "very much so".

The swimmers all felt that the procedure used in the study had been both acceptable ('6', '7' & '7') in the way that they were treated throughout, and useful (i.e. the content of the information that was provided), all reporting maximum scores of '7'. The usefulness of the information was supported to a certain degree, in that, when asked if they would continue to practise any of the skills that had been advocated in the study, again all three subjects expressed maximum values.

Replying once more to open-ended questions, all subjects expressed that they thought they had greatly benefited from the intervention programme in the following ways: "I now understand the concept and aims of what process goals are, and the programme has helped me achieve a positive frame of mind before races, and the ability for me to achieve a higher standard of swimming in the future" (2); "My performance has improved considerably and the way that I perceive pre-race situations has changed for the better" (3); "The study has made me think much more about what I should try and think about before a race, not only about the processes in the race but in training as well" (4).

The final open-ended question in the first part of the questionnaire required the swimmers to suggest, that if the intervention procedure has contributed to enhancing their swimming performance, why they believed this to be the case. The responses were again positive and consistent, for example: "I now have a much better understanding of my pre-race thoughts which I believe have benefited my personal goals - I see them positively.
which I don’t think I did before this season” (2); "Before the races I was using imagery of processes such as starts and turns to create positive thoughts on the performance and outcome. Doing this has helped me to improve my performance in the water” (3); "I think that the programme has made me more aware of what processes and parts make up a good race and that only by putting them together can you swim a good race. Also I no longer worry about the way I am feeling when I am nervous before the start” (4).

The last section of the first part of the questionnaire asked three specific questions relating to when and how many times the mental imagery routines were completed in the pre-competition period, and also when the physical warm-up was completed prior to the race. Subjects 2 and 3 indicated that they practised the imagery routine three times every week; Subject 4, on average, practised the routine four times every week. These sessions were completed mainly in the early part of the evening and occasionally in the mornings. All the swimmers completed the physical warm-up between fifteen and twenty minutes prior to the race.

6.562 Part 2

The second part of the social validation questionnaire was sealed and only opened after part one had been completed. This informed the subjects what the direct aim of the study was, and then asked a series of open-ended questions relating to the intensity and direction of cognitive and somatic anxiety, self-confidence and also briefly on goal setting. All three subjects expressed that they felt that the intensity of cognitive anxiety had remained stable throughout the study, with two expressing that the level of somatic anxiety had also remained stable. Subject 3 expressed that he thought the intensity of somatic anxiety had fluctuated in view of the fact he was not physically nervous prior to one of the final races because, "I knew I was swimming well” (3). Encouragingly, all subjects reported that they now feel that they interpret both cognitive anxiety and somatic anxiety as more facilitative towards the race. Indeed, Subject 3 expressed "I believe I feel more at ease with the fact that I feel butterflies or nervous before a race. These are good and will help me to perform better and makes me feel more confident”. Supporting these statements, all subjects reported that following the intervention they did feel more self-confident because they now accepted their pre-race anxiety symptoms as natural and were at ease with the way they felt before a competitive race.

The final part of the questionnaire briefly addressed goal setting strategies and any final comments that the subjects may have had relating to any aspect of the study. All subjects stated that the intervention had altered the way in which they set goals for their upcoming races. When asked to explain this, the subjects described: "I now set process goals” (2); "I used to set good attainable goals beforehand, but now this study has helped
me to advance my use of goal setting especially focusing more on processes" (3); and  
"By focusing on specific parts of the race it improved my performance by getting all of  
the race processes together, and by setting process goals a good process performance will  
make a good race performance" (4). Final comments mostly included brief notes of  
appreciation such as "I have benefited from this study and would be interested to  
participate as a subject again -Thanks".

6.57 Post-Test Follow-up Data

In order to assess the retention effects of the intervention treatment, two separate  
follow-up measures of state anxiety intensity and direction were collected between  
approximately four and five months past the post-test assessment phase as illustrated in  
Table 6.9.

Table 6.9 Follow-up Modified CSAI-2 Scores Following the Post-Test.

<table>
<thead>
<tr>
<th>Subject</th>
<th>Intensity Scores</th>
<th>Direction Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CAI</td>
<td>SAI</td>
</tr>
<tr>
<td>1</td>
<td>Race 1</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>Race 2</td>
<td>26</td>
</tr>
<tr>
<td>2</td>
<td>Race 1</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>Race 2</td>
<td>25</td>
</tr>
<tr>
<td>3</td>
<td>Race 1</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>Race 2</td>
<td>18</td>
</tr>
<tr>
<td>4</td>
<td>Race 1</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Race 2</td>
<td>23</td>
</tr>
</tbody>
</table>

Subjects 2, 3 and 4 who received the intervention are still reporting facilitative  
interpretations of anxiety and approximately the same intensity levels as previously  
observed. Furthermore, as alluded to in section 6.431, the control subject was provided  
with the intervention treatment following the completion of the main study. Findings for  
Subject 1 reveal that after 4 competitive races the treatment was effective and the subject  
started to report facilitative interpretations of both cognitive and somatic anxiety.
6.6 DISCUSSION

The previous study highlighted the developmental stages that ten elite swimmers progressed through to acquire and develop facilitative interpretations of their pre-race thoughts and feelings and the mental skills used now to maintain this facilitative interpretation. The results provided important practical implications for intervention research working with performers debilitated by their pre-competition anxiety symptoms. The present study, therefore, attempted to put into practice the information and advice generated from Study 3 in an attempt to restructure negative interpretations of anxiety. This was achieved via implementing an intervention package, including imagery, self-talk and goal setting skills, to three competitive swimmers who suffered from negative directional perceptions of anxiety. One other swimmer acted as a control subject and did not receive the treatment. The primary purpose of this study, therefore, was to assess an intervention to restructure debilitative interpretations of pre-competition anxiety using a staggered single-subject multiple-baseline across-subjects design which enabled the data to be collected in an ecologically-valid competitive sports situation. To restate, the hypotheses formulated predicted that the subjects receiving the treatment would report more facilitative interpretations of their pre-competition anxiety, and also higher self-confidence following the treatment. Furthermore, the control subject would continue to report debilitative interpretations of pre-competition anxiety throughout the study, and maintain stable confidence levels. Emanating from the findings of Study 2, a secondary purpose of the study was to educate and encourage the performers to set intrapersonal goals, such as performance and process goals, as opposed to adopting solely outcome targets.

Turning to the central focus of this study, the major hypotheses under investigation were supported, in that, although intensity levels remained stable, the three subjects who completed the intervention did report more facilitative interpretations of both pre-competition cognitive and somatic anxiety, and greater levels of confidence following the treatment. Furthermore, it is evident that the control subject, who also reported stable intensity levels, consistently reported debilitative interpretations of both cognitive and somatic anxiety symptoms and stable confidence levels throughout the ten races. Although researchers have advocated that single-subject designs eliminate the need for no-treatment control groups (Bryan, 1987), it was decided in view of the exploratory nature of this investigation to include one control subject. As alluded to previously in section 6.3, the aim of the control subject was to ensure that no external factors or circumstances, such as drastic improvements in performance, resulted in a change of directional perceptions, and if this had been the case, to further investigate the reasons for
the changes. Observing the findings more closely, the control subject reported stable intensity levels for cognitive anxiety, somatic anxiety and self-confidence. Importantly, at no time throughout the ten races were facilitative interpretations of pre-race symptoms reported. In the case of both cognitive and somatic anxiety, debilitating interpretations were reported in eight of the races. In the other two competitions, scores of zero were reported, signifying that the intensity of symptoms was interpreted as unimportant towards the upcoming race. Directing attention to the three swimmers who received the treatment, the programme appears to have been considerably successful in restructuring negative interpretations. Visual inspection of Figures 6.4 to 6.6 indicate firstly, that intensity levels remained generally stable for both cognitive and somatic anxiety throughout the study, with mean scores pre-intervention to post-intervention ranging no more than 2.75 points for cognitive anxiety and 1.86 for somatic anxiety. However, one or two fluctuating scores were evident in Subjects 3 on the intensity level of anxiety. Specifically, Subject 3 reported a very low intensity of somatic anxiety in Race 9, with a score of '10' which is difficult to explain. However, close observation of the social validation data revealed that this subject expressed that he was not particularly nervous by this stage of the season because as he expressed, "I knew I was swimming well". Subject 4 reported a high level of cognitive anxiety in Race 3, which was interpreted as debilitating and accompanied by low self-confidence, but this was prior to the intervention. Supporting the study hypothesis, therefore, the findings revealed that intensity levels did not decrease and remained stable in the subjects receiving the treatment.

Turning to the direction scores, all three subject who completed the treatment reported considerably more facilitative interpretations of both cognitive anxiety and somatic anxiety following the intervention. This was particularly successful in the case of Subject 2 whose cognitive anxiety intensity scores were extremely high. Specifically, when compared with the norms for competitive swimmers reported by Martens et al. (1990), the pre-intervention mean (26.0) equates to approximately the 96th percentile and post-intervention mean (25.57) with the 95th percentile. The smallest increase between pre and post-intervention means occurred in Subject 4, where mean scores increased from -3.8 to +2 for cognitive anxiety, and -2.4 to +3.8 for somatic anxiety. As expected, the treatment was not effective immediately in Subject's 2 and 3 with a realistic gradual change occurring in anxiety interpretations following the treatment. In Subject 4, directional perceptions altered from debilitating to facilitative in the first race following the intervention, which was unexpected. However, on close observation of the anxiety scores, it is evident that overall, Subject 4's interpretations of anxiety were not as debilitating prior to the intervention as Subjects 2 and 3. Therefore, the transition from
negative to positive perceptions was not as considerable as with the other swimmers. Importantly, however, none of the three subjects slipped back into interpreting symptoms as debilitative once the breakthrough into interpreting symptoms as facilitative had occurred.

This restructuring from negative to positive interpretations of anxiety symptoms was also accompanied by a considerable increase in confidence levels in these three subjects. Indeed, in Subjects 2 and 3 the mean confidence scores increased from 16 to 21.1, and 12.25 to 20.33 respectively. In comparison to CSAI-2 norms for swimmers reported by Martens et al. (1990), the pre-intervention means are extremely low equating to approximately the 7th percentile in Subject 2, and the 1st percentile for Subject 3. However, following the intervention the mean scores were considerably higher equating to approximately the 30th and 31st percentile respectively. This increase in confidence supports the findings of the first study in this thesis, that established that facilitative interpretations of anxiety symptoms were associated with higher levels of self-confidence. Socially validating the data in this study was particularly important in this instance to help explain the increase in confidence. Specifically, the responses on the questionnaire indicated that the subjects thought that confidence had increased primarily because the subjects felt more at ease with their pre-race thoughts and feelings. A second possible explanation relates to the fact that the swimmers expressed, via the social validation questionnaire, that they felt their performances had improved following the intervention, and indeed, a number of personal best times were recorded towards the end of the study. Self-confidence could have increased, therefore, due to the success that these swimmers were experiencing towards the end of the study.

The evidence from the modified CSAI-2 responses is encouraging, and even more so when considered in conjunction with the social validation data. Specifically, the three subjects receiving the treatment expressed in their own words that they believed intensity levels had remained generally stable throughout the study, but confidence had increased, and they believed that they had developed the ability to interpret both cognitive and somatic anxiety symptoms as more facilitative towards their races.

A secondary purpose of this study was to educate the swimmers to set more intrapersonal goals such as performance and process goals, and not solely outcome goals, therefore developing a more internal control perspective with regard to goal setting. The reason for the inclusion of this part of the intervention emanated from the findings of Study 2 in which performers with favourable expectancies of goal achievement reported more facilitative interpretations of their anxiety symptoms. Consequently, there is an increased probability of favourable expectations from goals that can be achieved independently of other competitors. The amount of information that could be examined
from the goal profile data is considerable, and therefore, only the most relevant result findings will be discussed. Progressing separately through each type of goal, it was evident that the control subject placed considerable importance on outcome goals. The position Subject 1 aimed to achieve in the race, typically to finish first, was the most important goal set throughout the study. Expectations of goal achievement varied between favourable and unfavourable, as did the actual achievement of these goals. Therefore, it is evident that Subject 1 was more concerned with setting goals that were outside personal control, where achievement is affected by external factors such as the other competitors in the race. It should be highlighted that focusing on the position to be achieved in the race was associated with debilitative interpretations of both cognitive and somatic anxiety throughout the race series for Subject 1.

The three subjects who received the goal setting education did continue to set outcome goals following the intervention. However, these goals became the least important type of goal set in Subjects 3 and 4. Outcome goals remained important for Subject 2 following the intervention, possibly indicating that focusing on the race position was a difficult habit to break, or simply that the outcome may have had important consequences for team points in the competition. Following the intervention, the subjects did hold more favourable expectations of achieving these goals than prior to the intervention, and indeed, did achieve a greater number of the positions they targeted. Therefore, the negative expectancies of goal achievement were associated with debilitative interpretations of anxiety which was reversed following the intervention. Subject 4 was the exception, in that for certain races following the intervention, he held negative expectations and did not achieve the goals. This is possibly due to the type of outcome goal that was set. In contrast to the other swimmers, Subject 4's outcome goals tended to be to finish in the top 8 or 16 places in the entire competition to qualify for a final swim. This type of outcome goal is different in nature to attempting to simply finish in the top three in your particular race for example. Specifically, the goal is not only dependent on the other competitors in your race, but also the competitors in previous and subsequent races. In competitions where ten or more heats are run for each event this type of goal is indeed challenging. However, although unfavourable expectancies of the outcome goals were reported, facilitative interpretations of anxiety were still maintained. The level of facilitation was less in Subject 4 than in Subject's 2 and 3, which may possibly have been due to the consistent importance placed on achieving a goal not solely within personal control.

Subject 1 set only four performance goals in the ten races, all carrying an uncertain expectation of achievement, and which were not considered as important as the outcome goals. Interestingly, these goals were achieved in three of the four races.
However, all carried only average difficulty levels, suggesting that the times to be achieved were probably well within this subjects capabilities.

A performance goal was set in all ten races by all three subjects receiving the intervention. This was not surprising in view of the well-structured swimming programme that the swimmers were part of, and the important emphasis directed towards performance times within their competitive squad. Prior to the intervention, these goals were primarily to achieve a season's best time, but following the intervention, they became increasingly difficult and challenging to achieve more personal best times. Prior to the intervention, these times were accompanied by more negative or uncertain expectancies. However, more favourable expectancies of goal achievement were reported following the intervention, which was also accompanied by a higher frequency of achievement. In all three subjects, the goals increased in importance after the intervention and were more important than the outcome goal, providing support for the success of this part of the intervention. Prior to the intervention, negative expectancies of performance goal achievement were associated with debilitative interpretations of anxiety. However, following the treatment, by placing more emphasis on goals that can be personally controlled, expectancies of achievement became favourable and were accompanied by more facilitative interpretations of anxiety symptoms.

Although the control subject set and achieved process goals, these were not considered as important as either the performance, or the most important outcome goals to Subject 1. Supporting the secondary purpose of the study, the three remaining subjects following the intervention placed more emphasis on this type of goal. Indeed, Subjects 2 and 4 did not set any process goals prior to the intervention, but set a process goal in every subsequent race. A positive expectancy of achieving the goals was reported in Subjects 2 and 4 following the intervention which was associated with facilitative interpretations of anxiety. This favourable expectancy was not unjustified, since the swimmers did achieve the process goals they set after the intervention. This was not surprising in view of the fact that process goal achievement is subjectively assessed by the individual competing in the race. Additionally, these goals were not considered as difficult to achieve as either the objectively assessed outcome and performance goals. Subject 3 set a process goal in all ten races, but reported more favourable expectancies of achieving the goals after the intervention. Interestingly, these goals were reported as more important than the outcome goal following the intervention for Subjects 2 and 3, and the most important goal for Subject 4. However, process goals were not considered as important as the performance times for Subjects 2 and 3.

Summarising the findings from the goal profile data, therefore, the intervention appears to have been successful in that the subjects who did receive the treatment adopted
a more internal control perspective with regards to their goal setting. Specifically, the subjects set a greater frequency of process goals after the intervention, and with performance goals, were reported as the most important targets after the intervention. A greater frequency of favourable expectancies of goal achievement were reported after the treatment, which was importantly associated with facilitative interpretations of cognitive and somatic anxiety. Conversely, Subject 1, who did not receive the goal setting education, continued to place the most importance on the position achieved in the race which was associated with debilitative anxiety interpretations. These results support the findings of Study 2, and the predictions of Jones' (1995a) control process model that positive goal attainment expectancies are associated with positive interpretations of anxiety symptoms. Furthermore, the results from the social validation questionnaire support the findings from the goal setting questionnaires. Specifically, all three subjects expressed that the programme had altered the way in which they set goals for their races, primarily via the education of the importance of process goals that are within personal control. The subjects realised via the goal setting education session, that a well executed individual performance is comprised of a number of subcomponents or processes, and via successfully achieving these sub-goals, the race times can be improved and consequently the outcome. The subjects therefore understood that there is more to goal setting than the position you aim to finish in the race.

Overall, the findings from this study reveal that the intervention treatment prescribed to the subjects was successful in restructuring anxiety interpretations. Possible reasons for the success of the programme can be attributed to the study design that was developed, which accounted for a number of the methodological weaknesses highlighted by Murphy (1990) in the intervention literature. Therefore, the actual study design adopted was an important strength, in that changes emerged in behaviour that may not have appeared as significant within a traditional nomothetic design. Murphy (1990) highlighted that previous studies have failed to provide details of the intervention; however, this study provided the specific intervention treatment procedure, and scripts used in the imagery sessions. Furthermore, Mackay (1981) expressed that imagery is an intangible skill, and therefore hard to control in a research study, but this study aimed to control this by using a carefully constructed script where the sport-specific verbal propositions, based on actual accounts from elite performers were included.

As recommended by Greenspan and Feltz (1989), social validation data was collected in this investigation. This proved to be an important strength, not only to substantiate and explain the central tenets of the study, but also as a manipulation check on how the treatment affected the subjects. Specifically, strengthening the internal reliability, validity and objectivity of the study, the subjects were unaware of the exact
purpose, or why they had been asked to participate. The subjects assumed that the aim was simply to help improve their pre-race mental preparation. Regarding the procedures used in the study, all subjects expressed that they understood fully what was expected of them and adhered very rigidly to the order of practices. Furthermore, the subjects felt they were treated well throughout the study and had learnt a great deal from the programme and would continue to practise the skills.

Although the findings of the study are encouraging, especially from an applied perspective, a number of weaknesses were evident. Primarily, the failure to directly collect performance measures. The reason was in view of the fact that swimming at the competitive standard examined in this study follows exact and scientific training cycles. Specifically, swimmers progress through a number of training phases including a build-up phase, a period of intense training and then a 'taper' or rest phase before the major competition of the cycle. The swimmers in this study would still have been in the intense training phase when the intervention was implemented which may have affected performance times due to factors such as physical fatigue. This was the main rationale underlying the decision not to directly collect performance data. However, it was evident from the observation of the goal profile responses, that following the intervention, a number of personal best performance times were achieved which was supported by the social validation data. The swimmers expressed that there had been improvements in performance throughout the study and that these changes were perceived as significant. Furthermore, when asked if the intervention had caused improvements in performance, the subjects expressed that they believed this to be the case for two reasons: firstly, that they no longer worried negatively about the symptoms they experienced prior to a race; and secondly, that they now acknowledged the importance of setting the correct types of goals.

One limitation, previously levelled at other research, related to the lack of knowledge and information as to which part of the intervention contributed most to the restructuring of negative interpretations of anxiety symptoms. This was not a direct concern in this study, as the central aim was directed towards restructuring debilitative interpretations via information generated by elite swimmers. In view of the fact that the elite swimmers expressed that they used a combination of skills to this end, this was the approach adopted for the intervention in this study. Although, it is not evident which component of the intervention contributed most to the restructuring of anxiety interpretations, it was evident that when combined together the programme was successful. This supports previous intervention research which established improvements in performance via the use of combining self-talk with other psychological skills (Kirschenbaum & Bale, 1984; Hamilton & Fremouw, 1985).
Furthermore, the failure to provide feedback on the CSAI-2 responses could be interpreted as a weakness of this study. However, feedback on directional perceptions may have resulted in respondent bias, therefore confounding the results. The intervention was left to run its course apart from the researcher showing an interest in each subject ensuring everything was progressing correctly.

Finally, there is of course the important issue of a Hawthorn effect, which is particularly relevant in single-subject designs where participants are treated individually. This refers to subjects behaving differently, simply as a result of the attention they receive in an investigation (Drew, 1976), and is most likely to occur when the subjects' normal routines are disturbed. Drew (1976) highlighted that this effect will decrease as the subjects become accustomed to the new routines implemented in the treatment, and therefore the length of the study is an important factor. However, as can be observed in Figures 6.4 to 6.6 the intervention effects did not diminish with time. Greenspan and Feltz (1989) further argued that a weakness of previous intervention research was the failure to conduct follow-up assessments of the central measures. In this study a follow-up assessment of the swimmers was conducted between four and five months after the post-test phase was completed. Encouragingly, the retention effects of the intervention were considerable in that the three subjects who received the treatment were still reporting facilitative interpretations of cognitive and somatic anxiety. Furthermore, Subject 1, who acted as the control in the original experiment has also successfully responded to the treatment and is now reporting more facilitative interpretations of pre-race anxiety symptoms. The encouraging findings from the post-test examination considerably strengthen the utility and effectiveness of the intervention programme. Specifically, the change in behaviour was still evident following a considerable period of time where the subjects were not recipients of individual attention from the author. Interestingly, Latimer and Sweet (1984) in the field of psychotherapy, suggested that if intervention effects are not retained for at least six months this questions the efficacy of the treatment. Therefore, further follow-up measures may be required to examine the effectiveness of the intervention over a longer period of time.

These findings provide compelling evidence that the treatment was successful when working with performers in the real world of competitive sport. Specifically, that interpretations of pre-competitive cognitive and somatic anxiety symptoms can be restructured to a more facilitative interpretations via intervention strategies. The content of such treatments is, however, crucial for positive changes in behaviour to be observed. Specifically, the components of this intervention package were derived from the previous research in this thesis. The intervention was, therefore, centred around perceptions of control (goal setting), rationalising thoughts and feelings and images and thoughts of
successful execution of skills (self-talk and imagery). Therefore, generating general principles from group designs, and investigating these using alternative qualitative methods of enquiry can generate very appropriate information for applied intervention research in sport psychology. The applied implications generated from the research highlight sport psychologists should ensure that performers learn a wide range of psychological skills that can be used as part of a complete and integrated structured psychological programme. Furthermore, that negative perceptions can be altered, but this is a gradual process, and therefore, requires development over time. Finally, these results suggest that debilitating interpretations of anxiety can be restructured without reducing the intensity level of the symptoms via stress management techniques.
CHAPTER VII

SUMMARY, DISCUSSION AND CONCLUSIONS

7.1 INTRODUCTION

The final chapter in this thesis is divided into three sections and is structured in the following way. The summary section provides a brief resume of the aims of the thesis, the issues examined and central findings of each of the four study. The discussion is subdivided into four sections which addresses: 1) theoretical issues emanating from the research; 2) the practical implications generated from these findings; 3) the strengths and weaknesses of the research programme; 4) future directions for study in the area of competitive anxiety. Finally, a number of conclusions are presented.

7.2 SUMMARY

The central aim of this thesis was to conduct a detailed examination of debilitative and facilitative dimensions of competitive state anxiety. As alluded to throughout this thesis, the majority of theoreticians accepted the traditional view of anxiety as being debilitative to performance without question. Indeed, Multidimensional Anxiety Theory (Martens et al., 1990) proposes a negative linear relationship between cognitive anxiety and performance, and that high levels of somatic anxiety above the optimum level result in decreases in performance. Therefore, this theory has continued to concentrate solely on levels of cognitive and somatic anxiety and failed to include any reference to the individual's interpretation of their anxiety symptoms. However, a small amount of research from the test anxiety literature (Alpert & Haber, 1960; Wine, 1980) and early findings in sport by Mahoney and Avener (1977) established evidence which suggested that anxiety could have positive performance consequences in certain individuals. This new conception, however, was not followed up in the sport psychology literature until the early 1990's with the introduction of the notion of directional perceptions.

The aims in the first two chapters were to examine how skill level and perceptions of control regarding goal attainment expectancies mediated the interpretation of anxiety symptoms. Furthermore, Study 3 aimed to establish how elite performers have acquired the ability to interpret their pre-race anxiety symptoms as positive. The objective of the final study was to investigate if debilitative directional perceptions could be restructured,
via psychological interventions, to a more positive interpretation of pre-race thoughts and feelings. The issue of investigating directional perceptions is critically important, because although conceptual advancement in anxiety has been forthcoming with the adoption of the multidimensional conceptualisation in recent years, it has become evident that the examination of solely intensity levels of anxiety is severely limited (Jones, 1991, 1995a, 1995b). Thus, there is a need to investigate other dimensions of the competitive anxiety response such as directional perceptions, to provide a more comprehensive picture of the study of anxiety. The following section provides a summary of each study and reports how the research questions for each of the studies was generated.

7.21 STUDY 1

The stimulus for the first study (Chapter 3) was based on the findings of Jones et al. (1993) and earlier findings in gymnastics by Mahoney & Avener (1977) which suggested that performers with high levels of skill interpreted their anxiety as a stimulant and consequently more positively than performers with lower levels of skill. The purpose of the study was to examine intensity and direction dimensions of state anxiety as a function of skill level. Study 1 examined 211 competitive swimmers one hour before competition via the completion of the modified CSAI-2, and subsequently separated the performers into elite (n=97) and non-elite (n=114) groups based on their achievement or non-achievement of national qualifying times. Results revealed that while there was no difference between the groups on the level or intensity of cognitive and somatic anxiety they experienced, the elite swimmers interpreted their anxiety symptoms as significantly more facilitative than the swimmers in the non-elite group. Self-confidence was also higher in the elite group. Furthermore, when the swimmers were dichotomised into facilitated and debilitated groups based on their cognitive and somatic anxiety direction scores, findings revealed that the there was no difference on the intensity of any CSAI-2 subscale between the elite facilitated or debilitated group. This suggested that the elite swimmers with debilitative interpretations had developed an effective coping mechanism for maintaining confidence levels. However, in the non-elite group, the debilitated subjects reported significantly higher levels of anxiety and lower confidence than the non-elite facilitators. These findings suggested that skill level was a determining factor on anxiety interpretations, in that, elite performers differed significantly on the direction subscale to their non-elite counterparts. Furthermore, intensity levels in non-elite performers did appear to influence directional perceptions. An important question emanating from these findings related to individuals' perceptions of control. Specifically, it was proposed that performers who were not confident in their ability to control
themselves and the environment were more likely to experience debilitative anxiety symptoms.

7.22 STUDY 2

The second study, reported in Chapter 4, aimed to examine a control process model proposed by Jones (1995a) which was based on the work of Carver and Scheier (1986, 1988). The model predicted that individuals' interpretations of their anxiety symptoms would be a function of their expectancies to achieve their goals, with favourable expectancies being associated with facilitative interpretations and unfavourable expectancies with debilitative interpretations. A second purpose of the study was to examine the face validity of the direction scale of the CSAI-2. A sample of high standard swimmers (n=91) completed the modified CSAI-2 and a goal attainment expectancy scale which assessed outcome, performance and process goal attainment expectancies one hour prior to competition. Also, an adjective labelling list was completed which required the subjects to indicate how they felt before the race from a list of positive and negative emotional labels. To address the secondary purpose, the swimmers were divided into facilitated and debilitated groups as described in the previous study. Results revealed that the performers in the facilitated group reported significantly more positive labels than the debilitated group who reported more negative labels. This demonstrated the ability of the direction scale to differentiate between performers who experienced different interpretations of anxiety. To examine the control model's proposals, the 45 swimmers who set all three types of goal were dichotomised into positive and negative/uncertain goal attainment expectancy groups for each of the three different goals. Results revealed no differences in intensity levels between the groups; however, the swimmers who expected to achieve their goals reported more facilitative anxiety interpretations for all three types of goal over the swimmers who did not feel capable of realising their targets. The findings generally supported Jones' (1995a) model, but more so for cognitive anxiety than somatic anxiety, in that somatic anxiety was interpreted positively in both groups. Therefore, both of the first two studies showed that anxiety can be interpreted as facilitative towards performance and consequently, the development and ability to interpret anxiety states as positive was the question to be addressed in the third study.

7.23 STUDY 3

The third study (Chapter 5) was designed to investigate how elite performers had developed the cognitive skills and strategies that enabled them to perceive their pre-race anxiety states as facilitative towards performance. It was recognised that different
individuals perceive anxiety symptoms differently from Studies 1 and 2, but not understood how this positive interpretation had evolved. Therefore, ten elite male competitive swimmers who consistently interpreted pre-race symptoms as facilitative were subjects who participated in a structured interview that progressed through their competitive careers. The interviews were transcribed verbatim and inductive content analysis procedures were introduced to structure the data. Results revealed that four general dimensions emerged from the transcripts, reporting how the swimmers were subject to the natural but negative thoughts and feelings before competition when they were young. However, they were educated and advised that the way they felt was in fact a positive state for competition by coaches and parents. Furthermore, these competitors developed and currently follow refined pre-competition and pre-race routines where thoughts and feelings are cognitively rationalised into a positive state. The results suggest that facilitative interpretations were acquired via natural learning experiences and educational methods, and that this interpretation was not innate, but gradually developed over time. An important question emanating from these findings related to whether negative interpretations could be restructured in performers debilitated by their anxiety symptoms via an intervention programme based on the elite swimmers accounts and recommendations.

7.24 STUDY 4

Study 4 (Chapter 6) examined the effects of a multicomponent intervention programme over a series of ten competitive races on four competitive swimmers who, prior to treatment, consistently interpreted both cognitive and somatic pre-race symptoms as debilitative. A secondary purpose, based on the findings of Study 2, was to educate the swimmers to adopt a more internal control perspective with regards to their competition goals. Therefore, the intervention included goal setting, imagery and self-talk strategies which emerged as particularly important from the previous two studies. These proposals were investigated via a staggered single-subject multiple-baseline across subjects design. Three subjects were exposed to the intervention, the other, selected at random, acted as a control and did not receive the treatment. Baseline measures were collected from the subjects one hour before competition via the modified CSAI-2 and pre/post-race goal setting questionnaires. After three, four and five races in the series the treatment was introduced to the three participating swimmers. Specifically, treatment involved a pre-competition routine comprising goal setting education and mental imagery, and a pre-race routine including positive self-talk, imagery and conscious decision making, that is, they decided a time to start their pre-race routine. Results revealed that the control subject continued to report debilitative interpretations of anxiety throughout the study and
maintained an external goal setting perspective concentrating on outcome goals. Intensity levels remained stable in the other three subjects, but following the intervention they gradually started to interpret their anxiety symptoms as more facilitative which was accompanied by an increase in confidence. Furthermore, the swimmers started to place more importance on performance and process goals, verifying a more internal perspective. Social validation data was also collected following the final race which substantiated the questionnaire findings. The swimmers reported, in their own words, that they felt they had developed the capacity to interpret pre-race symptoms as positive and felt more confident. Also, the swimmers testified that they had started to set goals for their races in a different manner. These findings provided strong evidence that the intervention was successful and that debilitative perceptions of anxiety could be restructured. This study, therefore, provided important practical implications for cognitive restructuring strategies for the sport psychologist.

7.3 DISCUSSION
This discussion attempts to conceptually draw the findings from the four research studies together and is divided into four sub-sections: theoretical issues; practical implications; strengths and limitations; and, future research directions.

7.31 THEORETICAL ISSUES
The following section highlights the central theoretical issues emanating from the findings of this thesis and is subdivided into five separate sections which discuss: issues of measurement and the value of examining the direction dimension: the control process model; the consistent findings from the four studies; limitations to traditional measurement of anxiety; and, finally the notion of facilitative anxiety.

7.311 The Measurement of Directional Perceptions
The first theoretical implication which was consistent throughout all four studies relates to the potential value of examining the directional perceptions of sports performers as an additional dimension of the anxiety response. In contrast to the majority of previous research into competitive anxiety, each study established that the symptoms associated with stressful sport situations can be interpreted as facilitative by certain performers. The quantitative findings from the first two studies would have established no difference in anxiety responses between the elite or non-elite groups, and the favourable or unfavourable goal expectancy groups respectively had the direction of the responses not been measured. Clearly, considerable differences in the pre-race mental states were evident between these groups, but this was a function of the interpretations
and not the levels of anxiety symptoms. The third study was further instrumental in illuminating the need to investigate directional perceptions. Specifically, the elite performers interviewed, reported in their own words, the importance of maintaining facilitative interpretations of mental and physical symptoms in order to achieve an optimal mental state and subsequent performance. Finally, Study 4 reiterated previous contentions by reporting how interpretations can be manipulated from a negative to a more positive orientation.

From a conceptual viewpoint, previous research has advocated for some time the necessity to examine the individual's interpretation of not only physical arousal (Bandura, 1977; Schachter, 1964) but also cognitive anxiety as appropriate or inappropriate (Eysenck, 1984). Schachter (1964) explained that the appraisal of physical arousal is a mediating factor on the individual's response to entering situations with either a negative or positive frame of mind. Eysenck (1984) argued that cognitive anxiety can actually improve performance due to compensatory increases in effort levels. Furthermore, Bandura (1977) suggested that the individual's interpretation of physical arousal affects the perception of ability to cope and consequently the level of self-efficacy. Relating to the ongoing anxiety-confidence debate within psychology which has been prominent for a number of years, Bandura's (1977) self-efficacy theory incorporated proposals regarding the relationship between self-efficacy and the anxiety response. Bandura views behaviour change as being mediated by self-efficacy expectations and that anxiety is an epiphenomenon resulting from a lack of self-efficacy. However, anxiety reductionist theorists, argue that the anxiety response is the direct cause of both self-efficacy expectations and behaviour change (Borkovec, 1976; Eysenck, 1978; Wolpe, 1978). Indeed, Eysenck (1978) referred to self-efficacy as simply an epiphenomenon resulting from a lack of anxiety. Therefore, Bandura (1977) would argue in the sporting context that successful performance and reduced competitive anxiety are determined primarily by the athlete's self-efficacy expectations. Conversely, Eysenck (1978) contends that an athlete's high degree of self-efficacy is an effect of reduced anxiety and that this reduced anxiety is the major determinant of a successful performance and self-efficacy. Unfortunately, as recognised by Jones (1995a), the research which has attempted to compare the self-efficacy model with the alternative anxiety-based model in predicting behaviour has proved inconclusive, with neither model gaining clear support (Feltz, 1982; McAuley, 1985b).

Therefore, building on the small amount of previous empirical research, the findings from the four studies in this thesis appear to be of significant conceptual importance, not only in further reiterating that direction is an essential dimension to measure in anxiety research, but also advancing knowledge on previously unknown areas
on individual anxiety interpretations. Specifically, the third study revealed a vast amount of rich data which explained in detail mechanisms by which elite performers are able to interpret anxiety as positive, and how the cognitive skills were acquired to generate and maintain this interpretation. Finally, advancement in knowledge was forthcoming primarily from a practical perspective that these mental skills can be transferred across individuals who do not possess the innate ability to interpret symptoms as facilitative.

These results suggest, therefore, that researchers and sport psychologist would be unwise to direct their attention to the sole study of intensity levels of cognitive and somatic anxiety without considering the nature of the performer's unique interpretation which appears to be a critical variable. Furthermore, researchers would also be advised to adopt not only quantitative but also qualitative methods of measurement in the examination of directional perceptions.

7.3.12 The Control Process Model

A second brief theoretical implication relates to the predictive value of Jones' (1995a) control process model which was examined in the second study. The model, developed primarily from the work of Carver and Scheier (1986, 1988), attempts to predict why certain individuals interpret anxiety symptoms as facilitative, while other individuals interpret the same symptoms as debilitative. The central determining factor between being able to interpret anxiety symptoms as facilitative or debilitative is the level of control that performers perceive they exert over themselves and the environment; that is, over behaviour and performance. The model's predictive value was tested directly as a function of goal attainment expectancies in Study 2, with performers with favourable expectations of goal achievement hypothesised to interpret anxiety symptoms as facilitative. Conversely, performers who perceived that goal achievement was outside their control would interpret anxiety symptoms as debilitative. The findings generally supported the model's predictions and suggests that the model does have predictive value of who will report facilitative and debilitative interpretations. In addition to the results of the second study, indirect support for the model was also provided in the third and fourth studies. Specifically, in Study 3, the swimmers talked about setting internal process goals which was a component of a psychological package which maintained facilitative interpretations, and in Study 4, the change in goal setting strategy to a more internal focus was also accompanied by more facilitative interpretations of anxiety. It is important to highlight that this is the only model which has attempted to conceptually explain why different individuals interpret anxiety symptoms differently, and therefore, extends understanding in the area of directional perceptions of anxiety symptoms.
7.3.13 Consistent Findings

The third theoretical issue relates to the repeated finding throughout the thesis that anxiety intensity levels did not differ between groups but that these levels of anxiety were interpreted differently (facilitative or debilitative) by different performers (see Figure 7.1). Specifically, in Study 1, both the elite and non-elite performers reported similar anxiety levels, but the elite performers interpreted them as more positive than the non-elite. The same pattern was evident in the second study, where the positive and negative goal expectancy groups also reported the same anxiety levels but the swimmers who favourably expected to achieve their goals held more facilitative interpretations than the swimmers who were not confident of attaining their race goals.

Reiterating the previous finding, the swimmers expressed in the interviews that they did not attempt to reduce anxiety symptoms and developed the ability to accept and positively interpret the way they felt prior to a race. The important issue in the third study was that it was the ten elite performers themselves who made this contention, and not simply the general results of statistical analysis. This adds credibility to the notion that elevated levels of anxiety, if interpreted appropriately, can be of considerable benefit to performers. In the final study it was evident that the perception of physical and mental anxiety symptoms could be restructured without modifying and reducing the levels of experienced anxiety. Indeed, this was clearly the case in the second subject who consistently reported extremely high intensity levels of his pre-race cognitive anxiety symptoms. Therefore, interpretations could turn around and perceived from a different viewpoint while the swimmers were experiencing identical amounts of competitive anxiety.

Further substantiating the findings of this thesis, two other studies have also established this relationship between intensity and direction dimensions of competitive anxiety. Jones and Swain (1992) found that although there were no differences between high and low competitive groups (measured by the Sport Orientation Questionnaire; Gill & Deeter, 1988) on the intensity of anxiety symptoms, the highly competitive group reported their anxiety as more facilitative and less debilitative than the low competitive group.

Furthermore, a recent study by Jones and Swain (1995) examined elite (n=68) and non-elite (n=65) competitive cricketers. The purpose was to examine trait responses to analyse if performers of different skill levels have predispositions to experience anxiety differently. Results strongly supported the findings of Study 1 in this thesis, in that no differences were evident in the anxiety intensity levels; however, the elite cricketers interpreted both cognitive and somatic anxiety as more facilitative to performance than the non-elite cricketers.
Figure 7.1  An Overview of Thesis Findings Relating to Relationship Between Intensity and Direction Dimensions of Competitive Anxiety

**Study 1**
Elite vs. non-elite groups
No differences in anxiety intensity, but elite group more facilitative than non-elite group

**Study 2**
Favourable vs. unfavourable goal attainment expectancy groups
No differences in anxiety intensity, but favourable group more facilitative than unfavourable group

**Study 3**
10 Elite Performers, consistently facilitative
Never tried to reduce intensity, but learned to interpreted symptoms as facilitative

**Study 4**
4 performers, consistently debilitative
Intervention resulted in no reduction in intensity of anxiety but interpretation restructured from debilitative to facilitative

**Consistent Finding**
Similar anxiety levels interpreted as facilitative or debilitative by different individuals
What is significant about these findings of Jones and Swain (1995), is that elite and non-elite performers appear to have predispositions to interpret anxiety levels differently. Consequently, in addition to the evidence provided in the first study, with differences emerging in the interpretation of state anxiety, the more recent study of Jones and Swain extends these findings by revealing that elite and non-elite performers appear to respond consistently in this way. This further substantiates the subject selection in the third study, in that, elite performers have a disposition to interpret anxiety symptoms as facilitative.

In summary, the repeated emergence that intensity levels did not differ between groups, as was also the case in other empirical studies, adds weight not only to the importance of the measurement and examination of this new dimension, but at a more applied level, the considerable practical implications that are forthcoming (see section 7.32).

7.314 Limitations to Traditional Measurement

It is evident that the orthodox measurement of solely the intensity level of anxiety is severely limited and somewhat out of date. This may be one possible reason for the equivocal findings from studies that have attempted to examine the relationship between anxiety and performance (Swain & Jones, 1996). Specifically, research examining anxiety intensity levels has only accounted for a small amount of performance variance and attributed this to methodological weaknesses of inappropriate study designs, data analysis and performance measures. However, the findings of Swain and Jones (1996) suggest that the measurement of directional perceptions may further understanding within this area. The focal point of this thesis evolved around a cognitive perspective where the importance of cognitive appraisal in stressful situations was acknowledged as a crucial determining factor in the way in which anxiety symptoms were perceived. The main criticism of former measurements of anxiety is the failure to account for this important interpretative factor.

Furthermore, as suggested in the discussion of Study 1, it is important to highlight that the items on the CSAI-2 are merely cognitive and physiological symptoms that are purported to measure anxiety. What this research suggests is that they are merely physical and mental symptoms that only assume significance following the individuals cognitive appraisal. Hardy and Jones (1990) speculated that if other dimensions, such as frequency and direction, were established in research to be important, then a radical rethink of the assessment of state anxiety would be necessary (see future directions; section 7.352). The studies in this thesis provide evidence to suggest this may now be the case.
7.315 Facilitative Anxiety?

The final theoretical implication from this research relates to precise labelling of what has been referred to as 'facilitative anxiety' throughout the four studies. It is important to recognise, at a theoretical level, that a pre-competition state in which cognitive and physiological symptoms, however intense, are interpreted as being facilitative to performance is unlikely to represent a state of 'anxiety' at all (Jones, 1995a). Alluding back to the discussion at the beginning of this thesis (section 2.2), from a conceptual perspective, anxiety is the resultant emotional response from an individual's cognitive appraisal that they are unable to cope with the demands of a particular stressor. Thus, by this definition, anxiety must always be considered as a negative emotion, with positive anxiety being somewhat of a contradiction in terms. Therefore, Jones (1995a) highlighted that alternatively, the positive state would probably be labelled by the performer as 'excitement', 'psyched up' or 'motivated' for the competitive event. Interestingly, this alternative labelling was reiterated by one swimmer in the Study 3 who explained how he thought there was a fine line between anxiety and excitement at major competitions. Furthermore, he reported how he was very close to the line when performing at his optimum, but that in pressure situations it would only take a small factor to cross the line from positive excitement to negative anxiety.

This contention has serious implications for the employment of traditional competitive state anxiety questionnaires which, for the most part, may be largely unsuitable due to their singular assessment of intensity levels. What may be more applicable, however, is the performer's own idiosyncratic labelling of experienced symptoms. This was highlighted in the findings of the second study, where performers were asked to label their precompetition states as positive or negative from a list of 22 emotional adjective labels. The labels were extrapolated from pilot interviews with experienced competitive swimmers asking them to describe the entire range of emotions they experienced prior to racing. The results supported the value of individual labelling of emotions when providing support for the face validity of the direction scale to distinguish between different interpretative states. Therefore, if the positive interpretation of what has been labelled as anxiety, is not anxiety per se, then research should aim to examine other positive and emotional states in the future (see section 7.356).

7.32 PRACTICAL IMPLICATIONS

The results of this thesis suggest that the same level of anxiety may be interpreted as either positive or negative by different individuals. Therefore, it is important to recognise that attempting to reduce intensity levels may be inappropriate if the symptoms are interpreted as facilitative. Prior to the interjection of directional perceptions into the
sport psychology literature, consultants would traditionally have attempted to facilitate coping by reducing levels of anxiety via either mental (e.g. Transcendental Meditation; Benson, 1976), physical (Progressive Muscular Relaxation; Jacobson, 1930), or combined multimodal stress management techniques (e.g. Stress Inoculation Training: Meichenbaum, 1975 or Cognitive Affective Stress Management; Smith 1980). Although sports requiring fine neuromuscular control may well benefit from a reduction in anxiety intensity, and particularly somatic anxiety, sports such as swimming may be adversely affected by relaxation techniques. Specifically, by analysing the nature of the sport and the prerequisites for optimal performance, it is evident that competitive swimming requires high physiological arousal, explosive power, strength and endurance. Therefore, in sports such as this, it would be more advisable to attempt to restructure negative perceptions of anxiety symptoms via cognitive restructuring strategies rather than attempt to reduce the levels of anxiety. A multicomponent psychological skills programme as reported in the final study in this thesis would therefore appear to be of considerable value to sports performers in swimming, and via modification at an individual sport level, also to competitors in other sporting disciplines.

What is important when advising practical implications from this research is that unlike other study programmes, the applied principles generated in the first three studies in the thesis were implemented with considerable success in the final study. Advice for practitioners from the final study suggests that performers need to learn a range of different psychological skills in order to restructure negative cognitions. Skills such as imagery, self-talk and goal setting need to be utilised to this end. It is important to highlight that the swimmers in the final study had well developed psychological skills prior to the start of the intervention. Consequently, the treatment focused more on modifying the content of images for example, away from social comparison and outcome concerns to a more internal perspective within the control of the individual. Therefore, in order for such a restructuring programme to be successful in other performers, well developed and practised psychological skills need to be present in the first instance. Furthermore, the results suggest that the restructuring process needs to be allowed time to take effect. This further supports the practical implications generated from Study 3 where the swimmers told how they learned to positively interpret symptoms over time. Sport psychologists clearly need to stress to performers, that as with the case of physical practice, they cannot expect immediate changes in behaviour, and through perseverance of adhering to the mental skills training, the desired changes can be observed. One further practical implication from the interviews related to the potential value of simple education in the restructuring process. The subjects in study 3 contended that basic instruction on how to view thoughts and feelings was sufficient to alter interpretations as
young competitors. Individuals coaching younger competitors need to be aware of the natural negative interpretations of nervousness in young performers, and aid the swimmers development by explaining the reasons for nervous symptoms.

A further important practical implication relates to preventing debilitative anxiety symptoms occurring in the first place. The antecedents of debilitative anxiety states have not been directly investigated in this thesis; however, the findings from Study 2 provide some valuable preventative information. A small amount of research has been conducted in the sport psychology literature examining the relationship between goal setting and anxiety (e.g. Hanton & Jones, 1995; Hardy et al., 1986, Jones et al., 1990; Lane, Terry & Karageorghis, 1995). Indeed the antecedent investigations of Jones et al. (1990), Hanton & Jones (1995) and Lane et al. (1995) all established that a position goal factor predicted the intensity of cognitive anxiety in middle distance runners, somatic anxiety in elite swimmers and both components in duathletes. Therefore, the interpersonal outcome goal emerged as a significant source of anxiety intensity.

In the context of the findings of Study 2, therefore, setting goals that performers feel are beyond their attainment and consequently outside personal control may lead to debilitative interpretations of anxiety. This is particularly relevant where importance is directed towards outcome goals, in that achievement is largely dependent upon the performances of other individuals. It is important, therefore, that coaches and performers should be educated in the value of setting goals that can be achieved independently of others such as performance and process goals.

Finally, on a more general level, consultant sport psychologists should be alerted to the potential problems and dangers of misinterpreting data generated from traditional anxiety questionnaires that assume anxiety is negative and detrimental towards performance. The results generated from this thesis draw attention to this and highlight further that the need to individualise in assessment is paramount. Each individual appraises and interprets anxiety symptoms differently, and therefore, examination of this dimension should be conducted at an individual level.

7.33 STUDY STRENGTHS

Possibly the major strength of this research thesis relates to the different methodological approaches that were utilised to address the research questions. Three diverse research methods were used in the research which progressed from: large cross-sectional quantitative based investigations (Studies 1 and 2); to qualitative retrospective structured interviews and inductive analytic procedures (Study 3); to staggered multiple-baseline single-subject methodology (study 4). Researchers such as Jones (1995a), Parfitt et al. (1990) and Martens (1987) have recommended the use of combined methods to
provide a more in-depth understanding of the study of anxiety. It is in the author's opinion that the adoption of different methods considerably enhanced the understanding of the directional perceptions of the anxiety response.

Much previous research in sport psychology has adopted nomothetic designs under the quantitative paradigm searching for objective knowledge via the testing of specific hypotheses. The nomothetic approach has tended to dominate the research literature in sport psychology, initially to provide the new emerging discipline of sport psychology with increased academic credibility as a scientific area of enquiry. However, researchers have acknowledged in recent years that other research avenues are available to be explored, such as the use of interview techniques and participant observation methods (e.g. Gould et al., 1992a, 1992b; Jackson, 1992; Scanlan, Ravizza & Stein, 1989). Qualitative methods have been underemployed in sport psychology in the past; however, these methods offer valuable insights into often misunderstood and exploratory concepts. These approaches are particularly salient when responding to the need to examine individuals in their real-life environment. It is in the author's opinion that the qualitative interviews conducted in the third study considerably increased the understanding of a research question that had not been previously addressed. Indeed, the author went to considerable pains to assess what happens in the naturalistic environment of athletes who were highly involved and experienced at the top of their sport. The quotations provided rich descriptive data and the emergent higher order themes and dimensions elaborated into an increasingly complex structure which provided a depth of understanding to the acquisition of facilitative interpretations. Specifically, the swimmers were able to identify and explain in their own words, not only the precise psychological skills used, but also how they were implemented in their routines. This detail and insight has previously been absent in research on directional perceptions, but provided the underpinnings to develop the successful programme of intervention treatment for the final study.

The final study also permitted considerable detail to be investigated, and the study design allowed for individual differences in anxiety, however small, to be identified. Some of the changes in behaviour would certainly have been hidden had a different design been adopted to address the question. Greenspan and Feltz (1989) highlighted that the collection of social validation data was important as a manipulation check in single-subject designs. The collection of these responses proved to be a considerable strength of the final study, in that, the subjects validated the findings themselves by reporting how they honestly believed that they interpreted anxiety symptoms as more facilitative and that there had been virtually no fluctuation in intensity. However, possibly the major strength of the last study pertains to the follow-up assessment of data beyond the post-
test. This has been an area considerably lacking in sport psychology research; however, researchers in psychotherapy (Galassi & Galassi, 1984; Latimer & Sweet, 1984) argued that if psychotherapeutic gains are not maintained for at least six months then the value and effectiveness of the intervention may come into question. Encouragingly, in the final study the subjects were still reporting facilitative interpretations after a four to five month period.

Therefore, advancement of knowledge was forthcoming from both theoretical and practical perspectives in this thesis by generating general principles from nomothetic group designs in the first two studies, investigating issues in detail using interviews (Study 3), and then implementing the findings and applications in the final study via the idiographic approach of a single-subject design.

One further strength of the research in Studies 1, 2 and 4 relates to the environment in which the performers were examined. Previously, sport psychology research has been criticised for examining performers in contrived laboratory settings with low ecological validity (Greenspan & Feltz, 1989; Swain & Jones, 1996; Weinberg, 1992). One of the major strengths of this thesis was that all the performers investigated were examined in ecologically valid competitive sport situations.

The final strength relates to the depth of knowledge that was acquired into the sport of competitive swimming. Indeed, there were two main reasons for adhering to the same sporting discipline throughout the thesis. Firstly, the sport provides an excellent vehicle for the conceptual examination and advancement of the anxiety response because the nature of the sport involves not only objective performance times, positions and processes which were important in the examination of competition goals in Studies 2 and 4, but also social comparison with other competitors. Secondly, swimming provides athletes with their individual racing environment (i.e. their own lane) in which they can perform up to their lifetime best without external interference from other competitors. The adherence to one sport is a strength in that it provides a consistent pattern and allows direct comparisons to be made within the context of this thesis. It also considerably increases the depth of knowledge in anxiety and sport psychology within the sport.

7.34 RESEARCH LIMITATIONS

Following on from the last point in the previous section, while the consistent use of the sport of swimming may have been a study strength, one limitation to this approach pertains to the transferability of the findings which may be somewhat restricted. Specifically, it is not clear to what degree the findings from this thesis are exclusive to competitive swimming; however, this issue is further addressed in the future directions for research (section 7.35).
A rather obvious weakness of this research carried out in this thesis relates to the performance of the swimmers who experienced either facilitated or debilitated anxiety states. Gould et al.'s (1992a, 1992b) findings on a sample of elite Olympic wrestlers showed that their worst performances were associated with negative pre-competition feeling states, and their best performances with positive feeling states. However, although this issue is of interest and considerable importance, swimming performance was not directly measured in any of the four studies and is acknowledged as a limitation. This issue was briefly addressed in the final study (section 6.6), explaining how the training programme of the swimmers may have affected performance, particularly in the intense training phase. Swimming performance is most commonly assessed via the time that the event is completed in. In view of the fact that performers would have been in different phases of training when collecting data for the studies, it was decided not to collect performance measures. Previous research has highlighted the potential problems in examining the anxiety-performance relationship; however, the impact of varying training cycles on performance has largely been ignored. In sports where intense training demands are placed on individuals in certain phases, performance will ultimately suffer due to factors such as physical and mental fatigue. Although this factor is difficult to control, researchers need to be aware of and compensate for training effects. Furthermore, the aims of the thesis were to examine in detail different aspects of facilitative and debilitative anxiety states and not to examine the relationship between direction and performance. However, this is an important issue to be addressed in future research (see section 7.35).

One possible limitation, which is, however, not exclusive to this thesis, refers to the heavy reliance on self-report measures for the purpose of data collection. The use of questionnaires on the whole has been subject to criticism with Fogarty (1995) for example, suggesting that their use was of limited value in sport psychology. Criticisms tend to focus around the issues of individuals distorting their responses and not conveying their honest and true feelings because of the influence of social desirability. Martens et al. (1990) explained how questionnaires are a valuable method of data collection provided that social desirability is minimised by issuing the correct instructions, establishing good rapport with the performers, and using social desirability scales to identify athletes likely to repress their true feelings. The accuracy of using questionnaires, therefore, depends on honesty, self-awareness and familiarisation with the inventory. However, while acknowledging the potential limitations of self-report questionnaires, at this point in time when psychophysiological measurements of anxiety are in their infancy and require further development, the continued use of questionnaires may continue to be the most accurate measuring instrument for the time being.
Furthermore, as anxiety is now widely accepted as a cognitive phenomenon, theorists may argue that the only true way of measuring this construct is via self-reports since the performer’s individual cognitive appraisal is the crucial factor.

Other main limitations relate to the failure to account for other individual difference variables within the research programme. The important issue of the transferability of the findings to other sports has been acknowledged at the beginning of this section; however, another limitation throughout the research is the failure to examine the differences between males and females. Sex differences have been acknowledged as an important variable in the examination of competitive anxiety (Jones & Cale, 1989b; Martens et al., 1990). Indeed, this thesis has been dominated in the final two studies by the examination of solely males. This was due to solely practical considerations, in that, elite female competitive swimmers of a similar standard to the males were not available in this country. Consequently, to directly transfer the findings from Study 3 to Study 4, males debilitated by anxiety were also chosen for treatment. The reason sex was not examined in the first two studies related to the programme aiming to develop general principles to drawn upon in the final studies. Furthermore, for reliability in the statistical analysis used in the studies, large sample sizes were required, and hence the need to combine males and females in the same groups.

7.35 FUTURE RESEARCH DIRECTIONS

This research has helped in advancing understanding of competitive anxiety in sports with a detailed programme of research aimed at the interpretations of anxiety symptoms. However, research into direction is in its early stages, and there are a considerable number of issues that require attention in the future. This section forwards suggestions for prospective research, not only into directional perceptions, but the study of anxiety in general.

7.351 Methodological Developments

At a methodological level, the potential value of using different research methods has been highlighted within this thesis. Future research should continue to progress from the over-reliance on quantitative information (Gould & Krane, 1992) and attempt to examine complicated phenomena from different perspectives using varied research methods. For example, the combination of qualitative and quantitative methods within one design could provide a wealth of information, in that, questionnaire data could be collected prior to competition, and the results of the questionnaire further probed by qualitative interview techniques. Alternatively, substantiating intervention studies with qualitative interviews to gain a greater insight into the mechanisms by which the
intervention affected behaviour may prove an interesting development. This would be particularly important in studies where more than one psychological skill is implemented to establish the relative contribution of each technique.

Two final points, already alluded to in section 7.33, relate to researchers continuing to try and examine performers within their natural settings where ecological validity is maximised, and also implementing follow-up assessments of performers to examine retention effects in intervention studies.

7.352 Measurement Developments

The findings from this thesis have highlighted the importance of measuring directional perceptions in addition to intensity levels of the competitive anxiety response. Indeed, promising psychometric properties of the direction scale were reported in Studies 1 and 2 in addition to supporting the face validity of the scale via the use of positive and negative adjective labels. However, the continued future adoption of the direction scale should also be accompanied by further psychometric testing on the modified CSAI-2.

The development of alternative methods of measurement should be a priority for interested researchers studying anxiety. The most prominent measuring instrument of the last few years, the CSAI-2, although instrumental in generating important conceptual developments, does not easily lend itself to assessing anxiety immediately prior to, or during competition. Specifically, most anxiety questionnaires are time-consuming to complete and difficult to administer close to the start of the competition for fear of disturbing the athletes' mental preparations. Taking, for example, the CSAI-2, completion of the inventory takes approximately five minutes for an individual familiar with the questionnaire, but considerably longer for a novice. When additional dimensions are administered in addition to the intensity scale, the time to complete increases considerably. Some research has been forthcoming in developing less intrusive single-item measures of intensity with some encouraging preliminary results (Krane et al., 1989; Hardy, in press). However, single-item measures of direction are in urgent need of development and empirical testing.

7.353 Future Research Addressing Directional Perceptions

Future research should attempt to address the individual difference variables, both at a person and situational level, which may predict facilitative and debilitative anxiety states. This thesis has examined the variables of skill level and perceptions of control. Furthermore, Jones, Swain and Harwood (1996) at the person level examined positive and negative affect (Watson & Clarke, 1984; Watson & Tellegen, 1985) and established that performers with a predisposition for high levels of negative affect consistently
perceive their symptoms, irrespective of intensity, as debilitative, and performers high on positive affect report symptoms as more facilitative.

Additional examination of self-confidence may also prove to be a worthwhile avenue of study. As highlighted in the discussion surrounding the first study, direction dimensions have been shown to correlate more strongly with confidence than the intensity dimensions of competitive anxiety. Findings from this thesis and Jones et al. (1993) suggest self-confidence may protect against debilitative interpretations of anxiety (cf. Hardy & Jones, 1990). Indeed, Studies 1 and 4 in this thesis reported that facilitated interpretations were associated with elevated self-confidence at both a group and individual performer level. These findings clearly have important practical implications for strategies to increase confidence and consequently the influence on directional interpretations of anxiety.

As implied earlier, the investigation of directional perceptions as a function of sex is in need of research attention. Specifically, if sport psychologists are to develop appropriate intervention strategies, any differences in the interpretations of anxiety between males and females needs to be unearthed.

Sport psychologists have recognised for some time that sports need to be investigated on an individual basis. Therefore, at a situational level, the nature of the sport may mediate directional perceptions. Indeed, this thesis has examined in detail the directional perceptions of competitive swimmers; however, future research should address the transferability of the findings not only in sports of a similar nature, but also across completely different natured sports. Jones (1995a) tentatively suggested that elevated anxiety symptoms, particularly somatic symptoms, will be interpreted as facilitative in short duration explosive sports such as sprinting and weight lifting. Conversely, high intensities of symptoms might be interpreted as debilitative in longer duration activities requiring more finely controlled motor skills such as pistol shooting. Furthermore, researchers should continue to examine the predictions of Jones' (1995a) control process model in other competitive sports in an attempt to address the transferability of the models predictions. These proposals highlight interesting research avenues for future attention.

In view of the fact that early research established differences in the temporal patterning of the anxiety response between performers of differing skill levels, it would be interesting to adopt a time-to-event study design, and examine the differences in intensity and direction dimensions as a function of proximity of competition. Furthermore, simultaneously examining the frequency of cognitive intrusions in such a design would allow investigation of the mediating effect frequency may have upon the interpretation of anxiety symptoms.
7.354 Anxiety During Performance

As discussed in section 2.543, there are considerable problems in the pursuit of attempting to examine anxiety during performance. Indeed, it is too simplistic to assume that the psychological state a performer reports one hour prior to competition would be the same as to the state the performer experiences during the event itself. Jones (1995a) stressed that it is overoptimistic to expect anxiety at thirty minutes or even one hour prior to competition to account for significant variance in performance and that examination needs to be significantly closer and actually during the competitive event. Therefore, despite the difficulties associated with measuring this area, it is important that researchers persist in their efforts, not only to measure the intensity of anxiety, but also the direction. Jones continued that the research into positive and negative emotions in the area of psychophysiology provides some hope (Davidson, 1992; Levenson, 1992) but the area may be one that proves elusive for researchers for some time to come.

7.355 Anxiety-Performance Relationship

In addition to the difficult challenges in terms of measuring anxiety during performance, the relative failure of researchers to account for any significant amount of performance variance is a continued concern. Limitations to the anxiety dimensions assessed via traditional questionnaires may be a consideration in this issue. Specifically, traditional anxiety questionnaires make the underlying assumption that anxiety has a negative effect on performance. However, recent empirical studies (Swain & Jones, 1996) have demonstrated that the direction scale, which measures both positive and negative states, accounted for more performance variance than the intensity scale. Interestingly, the AAT developed by Alpert and Haber (1960) predicted more variance in test performance than traditional test anxiety questionnaires. Therefore, researchers must continue to examine the relationship using scales that do not make the assumption that anxiety is a negative construct.

The performance measures themselves also require further refinement to account for small deviations in performances. Clearly, the global performance measures used in the majority of previous research have not been sensitive enough to detect the often minute differences between good and poor performances, particularly with elite level performers. Sport psychologists would therefore be advised to discuss and consult in more detail with coaches when designing studies to develop both objective and subjective sensitive performance measures.

Furthermore, there has been a reluctance with researchers to adopt an integrated perspective in their examination of the anxiety-performance relationship. As Hardy and Fazey (1987) contended, previous research has been hindered by the separate
measurement of cognitive and somatic anxiety in the study designs, and the assumption
that the components are statistically independent (Smith, 1989). This is particularly
relevant in view of the fact that Studies 1 and 2 in this thesis, and previous research
(Jones & Cale, 1989b; Karteroliotis & Gill, 1987) have reported moderate correlations
between cognitive and somatic anxiety during times of high stress. Therefore, using
catastrophe models as examples, future research should address the area of investigating
the interplay and interactive effects of the anxiety components on athletic performance.

Finally, recent studies (Jones et al., 1993; Swain & Jones, 1996) suggested that
elevated cognitive anxiety in certain performers in gymnastics and basketball
performance may improve performance up to a certain level by enhancing motivation and
maximising the appropriate attentional resources (Eysenck, 1984). However,
considerably more research is needed in this area to address the mechanisms by which
anxiety can have positive consequences for performance (Jones, 1995a).

7.356 The Examination of Other Emotions

Progressing away from solely the examination of anxiety, there is a need to
develop accurate and valid self-report measures that examine other cognitions and
emotions. The examination of the two mood structures of positive and negative affect
have provided some useful initial dispositional findings (Jones et al., 1995). However,
only a small amount of research has examined the effects of other emotions on target
shooting performance (Prapavessis & Grove, 1991), and athletics performance (Cockerill,
Nevill & Lyons, 1991). This research has tended to be dominated by the adoption of the
Profile of Mood States questionnaire (McNair, Lorr & Droppleman, 1971) and the
revised shortened version developed by Schacham (1983). Indeed, the research has
demonstrated that more successful performers exhibit more positive mood profiles than
less successful athletes (Heyman, 1982). However, as Jones (1995a) highlighted, this
should become a priority area for future research if sport psychologists are to assist in
developing optimal pre-competition states.

7.4 CONCLUSIONS

The purpose of this thesis has been to further development and understanding of
the competitive anxiety response with reference to the directional perceptions of anxiety
intensity levels in sports performers. The results illustrated that anxiety is not necessarily
negative and can be used to the performer’s advantage. Research into the directional
interpretations of anxiety is in its infancy and clearly there is still much to be understood;
however, the findings of this thesis appear to have enhanced a greater overall
understanding of conceptual and practical issues.
In summary, it has been shown that skill level and perceptions of control are mediating factors on directional perceptions. Furthermore, that the ability to interpret symptoms as positive was developed over time in elite performers by education and natural learning. It has also been shown that negative interpretations of anxiety symptoms can be restructured with the appropriate psychological intervention.

Importantly, the value of using a variety of distinct research techniques has been demonstrated to be an effective method for increasing depth and understanding of complex issues that have not been the subject of previous enquiry.

Finally, sport psychology essentially aims to facilitate athletic performance by refining the mental preparation of performers. In the author's opinion, this thesis has considerably progressed towards this goal.
References


APPENDIX 1 - Modified Version of the Competitive State Anxiety Inventory-2

The effects of highly competitive sports can be powerful and very different among athletes. The inventory you are about to complete measures how you feel right now about competition. Please complete the inventory as honestly as you can. Sometimes athletes feel that they should not admit to any nervousness, anxiety or worry they experience before competition because this is undesirable. Actually, these feelings are quite common, and to help me understand them I want you to share your feelings with me openly. If you worry about competition or have butterflies or other feelings that you know are signs of anxiety, please indicate these feelings accurately on the inventory. Equally, if you feel calm and relaxed, indicate those feelings as accurately as you can. Your answers will not be shared with anyone. I will be looking only at group responses. Please remember that you are responding to how you feel right now about competition.

**Directions:** A number of statements which athletes have used to describe their feelings before competition are given below. The questionnaire is divided into 2 sections. Read each statement and then circle the appropriate number, in each of the two sections, to the right statement to indicate how you feel right now. There are no right or wrong answers. Do not spend too much time on any one statement, but choose the answer which describes your feelings right now.

When you have this thought/ feeling do you normally regard it as negative (debilitative) or positive (facilitative) in relation to your upcoming performance. NB. if you have scored 'l' (not at all) on the first scale, then respond in relation to that feeling. E.g. If you respond 'not at all' to question 4, then you would respond on this scale as if you had no self-doubts.

<table>
<thead>
<tr>
<th>Statement</th>
<th>not at all</th>
<th>somewhat</th>
<th>moderately so</th>
<th>very much so</th>
<th>Very negative (i.e. debilitative)</th>
<th>Unimportant</th>
<th>Very positive (i.e. facilitative)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I am concerned about this competition</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>0</td>
</tr>
<tr>
<td>2. I feel nervous</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>0</td>
</tr>
<tr>
<td>3. I feel at ease</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>0</td>
</tr>
<tr>
<td>4. I have self doubts</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>0</td>
</tr>
<tr>
<td>5. I feel jittery</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>0</td>
</tr>
<tr>
<td>6. I feel comfortable</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>0</td>
</tr>
<tr>
<td>7. I am concerned that I may not do as well in this competition as I could</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>0</td>
</tr>
<tr>
<td>8. My body feels tense</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>0</td>
</tr>
<tr>
<td>9. I feel self-confident</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>0</td>
</tr>
<tr>
<td>10. I am concerned about losing</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>not at all</td>
<td>somewhat</td>
<td>moderately so</td>
<td>very much so</td>
<td>Very negative (i.e. debilitative)</td>
<td>Unimportant</td>
<td>Very positive (i.e. facilitative)</td>
</tr>
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<td>-----------------------------------</td>
<td>-------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>11.</td>
<td>I feel tense in my stomach</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
</tr>
<tr>
<td>12.</td>
<td>I feel secure</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
</tr>
<tr>
<td>13.</td>
<td>I am concerned about choking under pressure</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
</tr>
<tr>
<td>14.</td>
<td>My body feels relaxed</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
</tr>
<tr>
<td>15.</td>
<td>I am confident I can meet the challenge</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
</tr>
<tr>
<td>16.</td>
<td>I am concerned about performing poorly</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
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<tr>
<td>17.</td>
<td>My heart is racing</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
</tr>
<tr>
<td>18.</td>
<td>I'm confident about performing well</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
</tr>
<tr>
<td>19.</td>
<td>I'm worried about reaching my goal</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
</tr>
<tr>
<td>20.</td>
<td>I feel my stomach sinking</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
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<tr>
<td>21.</td>
<td>I feel mentally relaxed</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
</tr>
<tr>
<td>22.</td>
<td>I'm concerned that others will be disappointed with my performance</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
</tr>
<tr>
<td>23.</td>
<td>My hands are clammy</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
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<tr>
<td>24.</td>
<td>I'm confident because I mentally picture myself reaching my goal</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
</tr>
<tr>
<td>25.</td>
<td>I'm concerned I won't be able to concentrate</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
</tr>
<tr>
<td>26.</td>
<td>My body feels tight</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
</tr>
<tr>
<td>27.</td>
<td>I'm confident at coming through under pressure</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
</tr>
</tbody>
</table>
APPENDIX 2

Analysis of Variance Raw Data Accompanying Table 3.2

Cognitive Anxiety Intensity

One Factor ANOVA X 1: Elite/Non-Elite Y 1: Cog I

Analysis of Variance Table

<table>
<thead>
<tr>
<th>Source</th>
<th>DF:</th>
<th>Sum Squares:</th>
<th>Mean Square:</th>
<th>F-test:</th>
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<td>Between groups</td>
<td>1</td>
<td>.081</td>
<td>.081</td>
<td>.003</td>
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<tr>
<td>Within groups</td>
<td>209</td>
<td>5910.999</td>
<td>28.282</td>
<td>.9572</td>
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<tr>
<td>Total</td>
<td>210</td>
<td>5911.081</td>
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Model II estimate of between component variance = -28.201

<table>
<thead>
<tr>
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<th>Mean:</th>
<th>Std. Dev.:</th>
<th>Std. Error:</th>
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<tr>
<td>Group 1</td>
<td>114</td>
<td>20.246</td>
<td>5.334</td>
<td>.5</td>
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<tr>
<td>Group 2</td>
<td>97</td>
<td>20.206</td>
<td>5.299</td>
<td>.538</td>
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</tbody>
</table>

Comparison:          | Mean Diff.: | Fisher PLSD: | Scheffe F-test: | Dunnett t: |
<table>
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<tr>
<td>Group 1 vs. 2</td>
<td>.039</td>
<td>1.448</td>
<td>.003</td>
<td>.054</td>
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</tbody>
</table>
Cognitive Anxiety Direction

One Factor ANOVA X 1: Elite/Non-Elite Y 2: Cog D

Analysis of Variance Table

<table>
<thead>
<tr>
<th>Source</th>
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<th>F-test:</th>
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</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>1</td>
<td>681.942</td>
<td>681.942</td>
<td>9.542</td>
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<tr>
<td>Within groups</td>
<td>209</td>
<td>14936.854</td>
<td>71.468</td>
<td>p = .0023</td>
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<tr>
<td>Total</td>
<td>210</td>
<td>15618.796</td>
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Model II estimate of between component variance = 610.474

Group:

<table>
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<th>Std. Dev.:</th>
<th>Std. Error:</th>
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<tbody>
<tr>
<td>Group 1</td>
<td>114</td>
<td>.465</td>
<td>8.441</td>
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<tr>
<td>Group 2</td>
<td>97</td>
<td>4.072</td>
<td>8.47</td>
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Comparison:

<table>
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<th>Fisher PLSD:</th>
<th>Scheffe F-test:</th>
<th>Dunnett t:</th>
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<tbody>
<tr>
<td>Group 1 vs. 2</td>
<td>-3.607</td>
<td>2.302 *</td>
<td>9.542 *</td>
</tr>
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</table>

* Significant at 95%
Somatic Anxiety Intensity

One Factor ANOVA X 1: Elite/Non-Elite Y 3: Som I

Analysis of Variance Table

<table>
<thead>
<tr>
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<th>Mean Square:</th>
<th>F-test:</th>
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</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>1</td>
<td>.727</td>
<td>.727</td>
<td>.026</td>
</tr>
<tr>
<td>Within groups</td>
<td>209</td>
<td>5747.112</td>
<td>27.498</td>
<td>p = .871</td>
</tr>
<tr>
<td>Total</td>
<td>210</td>
<td>5747.839</td>
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<td></td>
</tr>
</tbody>
</table>

Model II estimate of between component variance = -26.772

<table>
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<tr>
<th>Group:</th>
<th>Count:</th>
<th>Mean:</th>
<th>Std. Dev.:</th>
<th>Std. Error:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>114</td>
<td>18.789</td>
<td>4.567</td>
<td>.428</td>
</tr>
<tr>
<td>Group 2</td>
<td>97</td>
<td>18.907</td>
<td>5.943</td>
<td>.603</td>
</tr>
</tbody>
</table>

Comparison:

<table>
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<tr>
<th>Group 1 vs. 2</th>
<th>Mean Diff.:</th>
<th>Fisher PLSD:</th>
<th>Scheffe F-test:</th>
<th>Dunnett t:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-.118</td>
<td>1.428</td>
<td>.026</td>
<td>.163</td>
</tr>
</tbody>
</table>
### Somatic Anxiety Direction

#### One Factor ANOVA \( X_1: \) Elite/Non-Elite \( Y_4: \) Som D

<table>
<thead>
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<th>Mean Square:</th>
<th>F-test:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>1</td>
<td>1333.228</td>
<td>1333.228</td>
<td>23.432</td>
</tr>
<tr>
<td>Within groups</td>
<td>209</td>
<td>11891.786</td>
<td>56.898</td>
<td>p = .0001</td>
</tr>
<tr>
<td>Total</td>
<td>210</td>
<td>13225.014</td>
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</table>

Model II estimate of between component variance = 1276.33

<table>
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<th>Count:</th>
<th>Mean:</th>
<th>Std. Dev.:</th>
<th>Std. Error:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>114</td>
<td>1.544</td>
<td>7.808</td>
<td>.731</td>
</tr>
<tr>
<td>Group 2</td>
<td>97</td>
<td>6.588</td>
<td>7.219</td>
<td>.733</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Mean Diff.:</th>
<th>Fisher PLSD:</th>
<th>Scheffe F-test:</th>
<th>Dunnett t:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1 vs. 2</td>
<td>-5.044</td>
<td>2.054 *</td>
<td>23.432 *</td>
<td>4.841</td>
</tr>
</tbody>
</table>

* Significant at 95%
## Self-Confidence

### One Factor ANOVA

**X**: Elite/Non-Elite  
**Y**: SC I

#### Analysis of Variance Table

<table>
<thead>
<tr>
<th>Source</th>
<th>DF:</th>
<th>Sum Squares</th>
<th>Mean Square</th>
<th>F-test:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>1</td>
<td>962.611</td>
<td>962.611</td>
<td>31.874</td>
</tr>
<tr>
<td>Within groups</td>
<td>209</td>
<td>6311.919</td>
<td>30.201</td>
<td>p = .0001</td>
</tr>
<tr>
<td>Total</td>
<td>210</td>
<td>7274.531</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Model II estimate of between component variance = 932.411

#### Group Statistics

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<tr>
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<th>Count</th>
<th>Mean:</th>
<th>Std. Dev.:</th>
<th>Std. Error:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>114</td>
<td>20.807</td>
<td>5.679</td>
<td>.532</td>
</tr>
<tr>
<td>Group 2</td>
<td>97</td>
<td>25.093</td>
<td>5.272</td>
<td>.535</td>
</tr>
</tbody>
</table>

#### Comparison

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Mean Diff.:</th>
<th>Fisher PLSD:</th>
<th>Schefte F-test:</th>
<th>Dunnett t:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1 vs. 2</td>
<td>-4.286</td>
<td>1.497 *</td>
<td>31.874 *</td>
<td>5.646</td>
</tr>
</tbody>
</table>

* Significant at 95%
APPENDIX 3

Contingency Summary Tables Accompanying Table 3.3

Coded Chi-Square $X_1$: Facil/Debil $Y_1$: Elite-Non-Elite

Summary Statistics

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DF:</td>
<td>1</td>
</tr>
<tr>
<td>Total Chi-Square</td>
<td>24.476 $p=.0001$</td>
</tr>
<tr>
<td>G Statistic</td>
<td>25.672</td>
</tr>
<tr>
<td>Contingency Coefficient</td>
<td>.371</td>
</tr>
<tr>
<td>Phi</td>
<td>.4</td>
</tr>
<tr>
<td>Chi-Square with continuity correction</td>
<td>22.816 $p=.0001$</td>
</tr>
</tbody>
</table>

Observed Frequency Table

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>Totals:</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>37</td>
<td>41</td>
<td>78</td>
</tr>
<tr>
<td>2</td>
<td>64</td>
<td>11</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td>101</td>
<td>52</td>
<td>153</td>
</tr>
</tbody>
</table>

Percents of Row Totals

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>Totals:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>47.44%</td>
<td>52.56%</td>
<td>100%</td>
</tr>
<tr>
<td>2</td>
<td>85.33%</td>
<td>14.67%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>66.01%</td>
<td>33.99%</td>
<td>100%</td>
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</tbody>
</table>
### Percents of Column Totals

<table>
<thead>
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<th>Totals:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>36.63%</td>
<td>78.85%</td>
<td>50.98%</td>
</tr>
<tr>
<td>2</td>
<td>63.37%</td>
<td>21.15%</td>
<td>49.02%</td>
</tr>
<tr>
<td>Totals:</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

### Expected Values

<table>
<thead>
<tr>
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<th>1</th>
<th>2</th>
<th>Totals:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>51.49</td>
<td>26.51</td>
<td>78</td>
</tr>
<tr>
<td>2</td>
<td>49.51</td>
<td>25.49</td>
<td>75</td>
</tr>
<tr>
<td>Totals:</td>
<td>101</td>
<td>52</td>
<td>153</td>
</tr>
</tbody>
</table>
APPENDIX 4

Analysis of Variance Raw Data Accompanying Table 3.4

Cognitive Anxiety Intensity

Anova table for a 2-factor Analysis of Variance on Y1: Cog I

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Sum of Squares:</th>
<th>Mean Square:</th>
<th>F-test:</th>
<th>P value:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facil/Debil (A)</td>
<td>1</td>
<td>55.005</td>
<td>55.005</td>
<td>2.127</td>
<td>.1469</td>
</tr>
<tr>
<td>Elite-Non-Elite (B)</td>
<td>1</td>
<td>22.056</td>
<td>22.056</td>
<td>.853</td>
<td>.3573</td>
</tr>
<tr>
<td>AB</td>
<td>1</td>
<td>132.371</td>
<td>132.371</td>
<td>5.118</td>
<td>.0251</td>
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<tr>
<td>Error</td>
<td>149</td>
<td>3853.964</td>
<td>25.866</td>
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<td></td>
</tr>
</tbody>
</table>

The AB Incidence table on Y1: Cog I

<table>
<thead>
<tr>
<th>Elite-Non-Elite level</th>
<th>level 1</th>
<th>level 2</th>
<th>Totals:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facil/Debil level 1</td>
<td>37</td>
<td>64</td>
<td>101</td>
</tr>
<tr>
<td></td>
<td>18.459</td>
<td>19.812</td>
<td>19.317</td>
</tr>
<tr>
<td>Facil/Debil level 2</td>
<td>41</td>
<td>11</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td>22.22</td>
<td>19</td>
<td>21.538</td>
</tr>
<tr>
<td>Totals:</td>
<td>78</td>
<td>75</td>
<td>153</td>
</tr>
<tr>
<td></td>
<td>20.436</td>
<td>19.693</td>
<td>20.072</td>
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</tbody>
</table>

253
**Somatic Anxiety Intensity**

Anova table for a 2-factor Analysis of Variance on Y

<table>
<thead>
<tr>
<th>Source:</th>
<th>df:</th>
<th>Sum of Squares:</th>
<th>Mean Square:</th>
<th>F-test:</th>
<th>P value:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facil/Debil (A)</td>
<td>1</td>
<td>79.509</td>
<td>79.509</td>
<td>3.096</td>
<td>.0805</td>
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<tr>
<td>Elite-Non-Elite (B)</td>
<td>1</td>
<td>12.432</td>
<td>12.432</td>
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<td>.4877</td>
</tr>
<tr>
<td>AB</td>
<td>1</td>
<td>156.738</td>
<td>156.738</td>
<td>6.103</td>
<td>.0146</td>
</tr>
<tr>
<td>Error</td>
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<td>3826.546</td>
<td>25.682</td>
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</tbody>
</table>

The AB Incidence table on Y2: Som I

<table>
<thead>
<tr>
<th>Elite-Non-Elite</th>
<th>level 1</th>
<th>level 2</th>
<th>Totals:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facil/Debil</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>level 1</td>
<td>37</td>
<td>64</td>
<td>101</td>
</tr>
<tr>
<td></td>
<td>16.838</td>
<td>18.625</td>
<td>17.97</td>
</tr>
<tr>
<td>level 2</td>
<td>41</td>
<td>11</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td>21.098</td>
<td>17.909</td>
<td>20.423</td>
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<tr>
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<td>78</td>
<td>75</td>
<td>153</td>
</tr>
<tr>
<td></td>
<td>19.077</td>
<td>18.52</td>
<td>18.804</td>
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</table>
## Self-Confidence

### Anova table for a 2-factor Analysis of Variance on Y

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<th>Mean Square:</th>
<th>F-test:</th>
<th>P value:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facil/Debil (A)</td>
<td>1</td>
<td>459.233</td>
<td>459.233</td>
<td>19.087</td>
<td>.0001</td>
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<tr>
<td>Elite-Non-Elite (B)</td>
<td>1</td>
<td>384.152</td>
<td>384.152</td>
<td>15.967</td>
<td>.0001</td>
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<tr>
<td>AB</td>
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<td>207.654</td>
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<td>.0038</td>
</tr>
<tr>
<td>Error</td>
<td>149</td>
<td>3584.873</td>
<td>24.06</td>
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### The AB Incidence table on Y: Self-C

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<th>level 1</th>
<th>level 2</th>
<th>Totals:</th>
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</thead>
<tbody>
<tr>
<td>level 1</td>
<td>37</td>
<td>64</td>
<td>101</td>
</tr>
<tr>
<td></td>
<td>25</td>
<td>26.031</td>
<td>25.653</td>
</tr>
<tr>
<td>level 2</td>
<td>41</td>
<td>11</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td>17.878</td>
<td>24.636</td>
<td>19.308</td>
</tr>
<tr>
<td>Totals:</td>
<td>78</td>
<td>75</td>
<td>153</td>
</tr>
<tr>
<td></td>
<td>21.256</td>
<td>25.827</td>
<td>23.497</td>
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</tbody>
</table>
APPENDIX 5

Scheffe Tests Accompanying Table 3.4

Cognitive Anxiety Intensity

<table>
<thead>
<tr>
<th>STATISTICA GENERAL MANOVA</th>
<th>Sheffe test; variable U1 Probabilities for Post-hoc Tests INTERACTION: 1 x 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
</tr>
<tr>
<td>U4 V5</td>
<td>18.45946</td>
</tr>
<tr>
<td>1 1 (1)</td>
<td>6468090</td>
</tr>
<tr>
<td>1 2 (2)</td>
<td>0.5468090</td>
</tr>
<tr>
<td>2 1 (3)</td>
<td>0.0161611</td>
</tr>
<tr>
<td>2 2 (4)</td>
<td>0.9923045</td>
</tr>
</tbody>
</table>

Somatic Anxiety Intensity

<table>
<thead>
<tr>
<th>STATISTICA GENERAL MANOVA</th>
<th>Sheffe test; variable U2 Probabilities for Post-hoc Tests INTERACTION: 1 x 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
</tr>
<tr>
<td>U4 V5</td>
<td>16.83784</td>
</tr>
<tr>
<td>1 1 (1)</td>
<td>0.4077241</td>
</tr>
<tr>
<td>1 2 (2)</td>
<td>0.4077241</td>
</tr>
<tr>
<td>2 1 (3)</td>
<td>0.0042473</td>
</tr>
<tr>
<td>2 2 (4)</td>
<td>0.9444078</td>
</tr>
</tbody>
</table>

Self-Confidence

<table>
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<tr>
<th>STATISTICA GENERAL MANOVA</th>
<th>Sheffe test; variable U3 Probabilities for Post-hoc Tests INTERACTION: 1 x 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
</tr>
<tr>
<td>U4 V5</td>
<td>25.00000</td>
</tr>
<tr>
<td>1 1 (1)</td>
<td>0.7924929</td>
</tr>
<tr>
<td>1 2 (2)</td>
<td>0.7924929</td>
</tr>
<tr>
<td>2 1 (3)</td>
<td>0.0000001</td>
</tr>
<tr>
<td>2 2 (4)</td>
<td>0.9973490</td>
</tr>
</tbody>
</table>
APPENDIX 6 - Modified Version of the Competitive State Anxiety Inventory-2

The effects of highly competitive sports can be powerful and very different among athletes. The inventory you are about to complete measures how you feel right now about competition. Please complete the inventory as honestly as you can. Sometimes athletes feel that they should not admit to any nervousness, anxiety or worry they experience before competition because this is undesirable. Actually, these feelings are quite common, and to help me understand them I want you to share your feelings with me openly. If you worry about competition or have butterflies or other feelings that you know are signs of anxiety, please indicate these feelings accurately on the inventory. Equally, if you feel calm and relaxed, indicate those feelings as accurately as you can. Your answers will not be shared with anyone. I will be looking only at group responses. Please remember that you are responding to how you feel right now about competition.

Directions: a number of statements which athletes have used to describe their feelings before competition are given below. The questionnaire is divided into 2 sections. Read each statement and then circle the appropriate number, in each of the two sections, to the right statement to indicate how you feel right now. There are no right or wrong answers. Do not spend too much time on any one statement, but choose the answer which describes your feelings right now.

When you have this thought/feeling do you normally regard it as negative (debilitative) or positive (facilitative) in relation to your upcoming performance. NB: if you have scored '1' (not at all) on the first scale, then respond in relation to that feeling e.g. If you respond 'not at all to question 3, then you would respond on this scale as if you had no self-doubts.

<table>
<thead>
<tr>
<th>Statement</th>
<th>not at all</th>
<th>somewhat</th>
<th>moderately so</th>
<th>very much so</th>
<th>Very negative (i.e. debilitative)</th>
<th>Unimportant</th>
<th>Very positive (i.e. facilitative)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I am concerned about this competition</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
<tr>
<td>2. I feel nervous</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
<tr>
<td>3. I have self-doubts</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
<tr>
<td>4. I feel jittery</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
<tr>
<td>5. I am concerned that I may not do as well in this competition as I could</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
<tr>
<td>6. My body feels tense</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
<tr>
<td>7. I am concerned about losing</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
<tr>
<td>8. I feel tense in my stomach</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
<tr>
<td>9. I am concerned about choking under pressure</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
<tr>
<td>10. My body feels relaxed</td>
<td>not at all</td>
<td>somewhat</td>
<td>moderately so</td>
<td>very much so</td>
<td>Very negative (i.e., debilitative)</td>
<td>Unimportant</td>
<td>Very positive (i.e., facilitative)</td>
</tr>
<tr>
<td>---------------------------</td>
<td>-----------</td>
<td>----------</td>
<td>----------------</td>
<td>--------------</td>
<td>---------------------------------</td>
<td>-------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>11. I am concerned about performing poorly</th>
<th>not at all</th>
<th>somewhat</th>
<th>moderately so</th>
<th>very much so</th>
<th>Very negative (i.e., debilitative)</th>
<th>Unimportant</th>
<th>Very positive (i.e., facilitative)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>12. My heart is racing</th>
<th>not at all</th>
<th>somewhat</th>
<th>moderately so</th>
<th>very much so</th>
<th>Very negative (i.e., debilitative)</th>
<th>Unimportant</th>
<th>Very positive (i.e., facilitative)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>13. I'm worried about reaching my goal</th>
<th>not at all</th>
<th>somewhat</th>
<th>moderately so</th>
<th>very much so</th>
<th>Very negative (i.e., debilitative)</th>
<th>Unimportant</th>
<th>Very positive (i.e., facilitative)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>14. I feel my stomach sinking</th>
<th>not at all</th>
<th>somewhat</th>
<th>moderately so</th>
<th>very much so</th>
<th>Very negative (i.e., debilitative)</th>
<th>Unimportant</th>
<th>Very positive (i.e., facilitative)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>15. I'm concerned that others will be disappointed with my performance</th>
<th>not at all</th>
<th>somewhat</th>
<th>moderately so</th>
<th>very much so</th>
<th>Very negative (i.e., debilitative)</th>
<th>Unimportant</th>
<th>Very positive (i.e., facilitative)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>16. My hands are clammy</th>
<th>not at all</th>
<th>somewhat</th>
<th>moderately so</th>
<th>very much so</th>
<th>Very negative (i.e., debilitative)</th>
<th>Unimportant</th>
<th>Very positive (i.e., facilitative)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>17. I'm concerned I won't be able to concentrate</th>
<th>not at all</th>
<th>somewhat</th>
<th>moderately so</th>
<th>very much so</th>
<th>Very negative (i.e., debilitative)</th>
<th>Unimportant</th>
<th>Very positive (i.e., facilitative)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>18. My body feels tight</th>
<th>not at all</th>
<th>somewhat</th>
<th>moderately so</th>
<th>very much so</th>
<th>Very negative (i.e., debilitative)</th>
<th>Unimportant</th>
<th>Very positive (i.e., facilitative)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
</tbody>
</table>
**APPENDIX 7**  

**Adjective Labelling List**  

**Instructions**  

Below are a number of words that might describe how you feel at this present time. Please tick the words that best describe how you are feeling overall **right now**.

<table>
<thead>
<tr>
<th>Adjective</th>
<th>[ ]</th>
<th>Adjective</th>
<th>[ ]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motivated</td>
<td></td>
<td>Energetic</td>
<td></td>
</tr>
<tr>
<td>Tense</td>
<td>[ ]</td>
<td>Focused</td>
<td></td>
</tr>
<tr>
<td>Active</td>
<td>[ ]</td>
<td>Relaxed</td>
<td></td>
</tr>
<tr>
<td>Composed</td>
<td>[ ]</td>
<td>Psyched Up</td>
<td></td>
</tr>
<tr>
<td>Lively</td>
<td>[ ]</td>
<td>Anxious</td>
<td></td>
</tr>
<tr>
<td>Determined</td>
<td>[ ]</td>
<td>Lazy</td>
<td></td>
</tr>
<tr>
<td>Lethargic</td>
<td>[ ]</td>
<td>Distressed</td>
<td></td>
</tr>
<tr>
<td>Confident</td>
<td>[ ]</td>
<td>Physically Upset</td>
<td></td>
</tr>
<tr>
<td>Excited</td>
<td>[ ]</td>
<td>Depressed</td>
<td></td>
</tr>
<tr>
<td>Jittery</td>
<td>[ ]</td>
<td>Scared</td>
<td></td>
</tr>
<tr>
<td>Doubtful</td>
<td>[ ]</td>
<td>Nervous Wreck</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX 8

Goal Attainment Expectancy Scale

INSTRUCTIONS

Please complete the following questionnaire prior to your next competitive race

GOALS THAT MAY HAVE BEEN SET FOR YOUR NEXT RACE

"Goal setting" is about setting targets for performance. There are essentially three different types of goals that performers may set themselves for a race. These are: (1) outcome goals (the position you aim to achieve in the race); (2) performance goals (the time you aim to swim for the race); (3) process goals (e.g. achieving a fast start, streamlined turns, efficient stroke technique etc). For this study refer to the goals that may have been set for the next race. Please note that it is possible to set more than one type of goal."

1. Have you set any goals for this race?
   YES [ ]    NO[ ]

2. Have you set a position goal for this next race?
   YES [ ]    NO[ ] (If No go on to Time Goals)

3. If YES please tick the box which corresponds to what this position goal is:
   1st        [ ]
   Top 3      [ ]
   Top 6/8    [ ]
   Another Goal [ ] (Please State:__________________________________________)

4. To what extent do you think you will achieve this position goal?

<table>
<thead>
<tr>
<th>Definitely No</th>
<th>Uncertain</th>
<th>Definitely Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>-4</td>
<td>-3</td>
<td>1</td>
</tr>
<tr>
<td>-3</td>
<td>-2</td>
<td>2</td>
</tr>
<tr>
<td>-2</td>
<td>-1</td>
<td>3</td>
</tr>
<tr>
<td>-1</td>
<td>0</td>
<td>4</td>
</tr>
</tbody>
</table>
PERFORMANCE GOALS

5. Have you set a time goal for this next race?
   YES [ ]  NO[ ]  (If No go on to Process Goals)

6. If YES please tick the box which corresponds to what this time goal is:
   Personal Best [ ]
   Seasons Best [ ]
   Another Goal [ ] (Please State: _________________________________)

7. To what extent do you think you will achieve this time goal?
   Definitely
   No   -4   -3   -2   -1   0   1   2   3   4
   Uncertain
   Definitely
   Yes

PROCESS GOALS

8. Have you set a process goal(s) for this next race?
   YES [ ]  NO[ ]

9. If YES please indicate what your one primary process goal is:

   _________________________________

10. To what extent do you think you will achieve this process goal?
    Definitely
    No   -4   -3   -2   -1   0   1   2   3   4
    Uncertain
    Definitely
    Yes
APPENDIX 9

Analysis of Variance Raw Data Accompanying Table 4.2

Positive Labels

One Factor ANOVA $X_1$: Facil/Debil $Y_1$: Number + Labells

Analysis of Variance Table

<table>
<thead>
<tr>
<th>Source</th>
<th>DF</th>
<th>Sum Squares</th>
<th>Mean Square</th>
<th>F-test:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>1</td>
<td>77.319</td>
<td>77.319</td>
<td>13.653</td>
</tr>
<tr>
<td>Within groups</td>
<td>64</td>
<td>362.438</td>
<td>5.663</td>
<td>$p = .0005$</td>
</tr>
<tr>
<td>Total</td>
<td>65</td>
<td>439.758</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Model II estimate of between component variance = 71.656

One Factor ANOVA $X_1$: Facil/Debil $Y_1$: Number + Labells

<table>
<thead>
<tr>
<th>Group</th>
<th>Count</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Std. Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>45</td>
<td>4.8</td>
<td>2.519</td>
<td>.376</td>
</tr>
<tr>
<td>Group 2</td>
<td>21</td>
<td>2.476</td>
<td>2.04</td>
<td>.445</td>
</tr>
</tbody>
</table>

One Factor ANOVA $X_1$: Facil/Debil $Y_1$: Number + Labells

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Mean Diff.:</th>
<th>Fisher PLSD:</th>
<th>Scheffe F-test:</th>
<th>Dunnett t:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1 vs. 2</td>
<td>2.324</td>
<td>1.257*</td>
<td>13.653*</td>
<td>3.695</td>
</tr>
</tbody>
</table>

* Significant at 95%
### Negative Labels

**One Factor ANOVA** $X_1$: Facil/Debil  $Y_2$: Number - labels

#### Analysis of Variance Table

<table>
<thead>
<tr>
<th>Source:</th>
<th>DF:</th>
<th>Sum Squares:</th>
<th>Mean Square:</th>
<th>F-test:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>1</td>
<td>31.74</td>
<td>31.74</td>
<td>14.181</td>
</tr>
<tr>
<td>Within groups</td>
<td>64</td>
<td>143.244</td>
<td>2.238</td>
<td>p = .0004</td>
</tr>
<tr>
<td>Total</td>
<td>65</td>
<td>174.985</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Model II estimate of between component variance = 29.502

**One Factor ANOVA** $X_1$: Facil/Debil  $Y_2$: Number - labels

<table>
<thead>
<tr>
<th>Group:</th>
<th>Count:</th>
<th>Mean:</th>
<th>Std. Dev.:</th>
<th>Std. Error:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>45</td>
<td>1.178</td>
<td>1.267</td>
<td>.189</td>
</tr>
<tr>
<td>Group 2</td>
<td>21</td>
<td>2.677</td>
<td>1.906</td>
<td>.416</td>
</tr>
</tbody>
</table>

**One Factor ANOVA** $X_1$: Facil/Debil  $Y_2$: Number - labels

<table>
<thead>
<tr>
<th>Comparison:</th>
<th>Mean Diff.:</th>
<th>Fisher PLSD:</th>
<th>Scheffe F-test:</th>
<th>Dunnett t:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1 vs. 2</td>
<td>-1.489</td>
<td>.79*</td>
<td>14.181*</td>
<td>3.766</td>
</tr>
</tbody>
</table>

* Significant at 95%
APPENDIX 10

Analysis of Variance Raw Data Accompanying Table 4.3

Cognitive Anxiety Intensity

One Factor ANOVA  \( X_1 \): Outcome  \( Y_1 \): CAI

Analysis of Variance Table

<table>
<thead>
<tr>
<th>Source:</th>
<th>DF:</th>
<th>Sum Squares:</th>
<th>Mean Square:</th>
<th>F-test:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>1</td>
<td>61.869</td>
<td>61.869</td>
<td>2.879</td>
</tr>
<tr>
<td>Within groups</td>
<td>43</td>
<td>923.909</td>
<td>21.486</td>
<td>( p = .0969 )</td>
</tr>
<tr>
<td>Total</td>
<td>44</td>
<td>985.778</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Model II estimate of between component variance = 40.382

<table>
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<tr>
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<th>Count:</th>
<th>Mean:</th>
<th>Std. Dev.:</th>
<th>Std. Error:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>33</td>
<td>19.515</td>
<td>4.829</td>
<td>.841</td>
</tr>
<tr>
<td>Group 2</td>
<td>12</td>
<td>22.167</td>
<td>4.019</td>
<td>1.16</td>
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Comparison:

<table>
<thead>
<tr>
<th>Comparison:</th>
<th>Mean Diff.:</th>
<th>Fisher PLSD:</th>
<th>Scheffe F-test:</th>
<th>Dunnett t:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1 vs. 2</td>
<td>-2.652</td>
<td>3.152</td>
<td>2.879</td>
<td>1.697</td>
</tr>
</tbody>
</table>
Cognitive Anxiety Direction

One Factor ANOVA  \( X_1: \) Outcome  \( Y_2: \) CAD

Analysis of Variance Table

<table>
<thead>
<tr>
<th>Source</th>
<th>DF:</th>
<th>Sum Squares:</th>
<th>Mean Square:</th>
<th>F-test:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>1</td>
<td>648.328</td>
<td>648.328</td>
<td>8.213</td>
</tr>
<tr>
<td>Within groups</td>
<td>43</td>
<td>3394.25</td>
<td>78.936</td>
<td>p = .0064</td>
</tr>
<tr>
<td>Total</td>
<td>44</td>
<td>4042.578</td>
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<td></td>
</tr>
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</table>

Model II estimate of between component variance = 569.392

Group:  Count:  Mean:  Std. Dev.:  Std. Error:

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<th>Std. Dev.</th>
<th>Std. Error</th>
</tr>
</thead>
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<tr>
<td>Group 1</td>
<td>33</td>
<td>5.667</td>
<td>9.594</td>
<td>1.67</td>
</tr>
<tr>
<td>Group 2</td>
<td>12</td>
<td>-2.917</td>
<td>6.388</td>
<td>1.844</td>
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Comparison:

<table>
<thead>
<tr>
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<th>Mean Diff.:</th>
<th>Fisher PLSD:</th>
<th>Scheffe F-test:</th>
<th>Dunnett t:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1 vs. 2</td>
<td>8.583</td>
<td>6.041 *</td>
<td>8.213 *</td>
<td>2.866</td>
</tr>
</tbody>
</table>

* Significant at 95%
Somatic Anxiety Intensity

One Factor ANOVA X1: Outcome Y3: SAI

Analysis of Variance Table

<table>
<thead>
<tr>
<th>Source</th>
<th>DF:</th>
<th>Sum Squares</th>
<th>Mean Square</th>
<th>F-test:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>1</td>
<td>.002</td>
<td>.002</td>
<td>7.260E-5</td>
</tr>
<tr>
<td>Within groups</td>
<td>43</td>
<td>1196.576</td>
<td>27.827</td>
<td>p = .9932</td>
</tr>
<tr>
<td>Total</td>
<td>44</td>
<td>1196.578</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Model II estimate of between component variance = -27.825

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<tr>
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<th>Count</th>
<th>Mean:</th>
<th>Std. Dev.:</th>
<th>Std. Error:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>33</td>
<td>17.818</td>
<td>5.145</td>
<td>.896</td>
</tr>
<tr>
<td>Group 2</td>
<td>12</td>
<td>17.833</td>
<td>5.638</td>
<td>1.628</td>
</tr>
</tbody>
</table>

Comparison:

<table>
<thead>
<tr>
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<th>Mean Diff.:</th>
<th>Fisher PLSD:</th>
<th>Scheffe F-test:</th>
<th>Dunnett t:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-.015</td>
<td>3.587</td>
<td>7.260E-5</td>
<td>.009</td>
</tr>
</tbody>
</table>
Somatic Anxiety Direction

One Factor ANOVA X1: Outcome Y4: SAD

Analysis of Variance Table

<table>
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<tr>
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<th>DF:</th>
<th>Sum Squares:</th>
<th>Mean Square:</th>
<th>F-test:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>1</td>
<td>316.001</td>
<td>316.001</td>
<td>5.849</td>
</tr>
<tr>
<td>Within groups</td>
<td>43</td>
<td>2322.977</td>
<td>54.023</td>
<td>p = .0199</td>
</tr>
<tr>
<td>Total</td>
<td>44</td>
<td>2638.978</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Model II estimate of between component variance = 261.978

<table>
<thead>
<tr>
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<th>Count</th>
<th>Mean:</th>
<th>Std. Dev.:</th>
<th>Std. Error:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>33</td>
<td>7.576</td>
<td>7.698</td>
<td>1.34</td>
</tr>
<tr>
<td>Group 2</td>
<td>12</td>
<td>1.583</td>
<td>6.23</td>
<td>1.798</td>
</tr>
</tbody>
</table>

Comparison:

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Mean Diff.:</th>
<th>Fisher PLSD:</th>
<th>Scheffe F-test:</th>
<th>Dunnett t:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1 vs. 2</td>
<td>5.992</td>
<td>4.997 ⋆</td>
<td>5.849 ⋆</td>
<td>2.419</td>
</tr>
</tbody>
</table>

⋆ Significant at 95%
APPENDIX 11

Analysis of Variance Raw Data Accompanying Table 4.4

Cognitive Anxiety Intensity

One Factor ANOVA $X_1$: Perform $Y_1$: CAI

Analysis of Variance Table

<table>
<thead>
<tr>
<th>Source</th>
<th>DF</th>
<th>Sum Squares</th>
<th>Mean Square</th>
<th>F-test:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>1</td>
<td>75.44</td>
<td>75.44</td>
<td>3.563</td>
</tr>
<tr>
<td>Within groups</td>
<td>43</td>
<td>910.338</td>
<td>21.171</td>
<td>$p = .0658$</td>
</tr>
<tr>
<td>Total</td>
<td>44</td>
<td>985.778</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Model II estimate of between component variance = 54.269

Group: Count: Mean: Std. Dev.: Std. Error:

<table>
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<th>Std. Dev.:</th>
<th>Std. Error:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>26</td>
<td>19.115</td>
<td>4.466</td>
<td>.876</td>
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<td>Group 2</td>
<td>19</td>
<td>21.737</td>
<td>4.782</td>
<td>1.097</td>
</tr>
</tbody>
</table>

Comparison:

<table>
<thead>
<tr>
<th>Group 1 vs. 2</th>
<th>Mean Diff.:</th>
<th>Fisher PLSD:</th>
<th>Scheffe F-test:</th>
<th>Dunnett t:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-2.621</td>
<td>2.801</td>
<td>3.563</td>
<td>1.888</td>
</tr>
</tbody>
</table>
Cognitive Anxiety Direction

One Factor ANOVA  X₁: Perform  Y₂: CAD

Analysis of Variance Table

<table>
<thead>
<tr>
<th>Source</th>
<th>DF</th>
<th>Sum Squares</th>
<th>Mean Square</th>
<th>F-test:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>1</td>
<td>1337.616</td>
<td>1337.616</td>
<td>21.264</td>
</tr>
<tr>
<td>Within groups</td>
<td>43</td>
<td>2704.962</td>
<td>62.906</td>
<td>p = .0001</td>
</tr>
<tr>
<td>Total</td>
<td>44</td>
<td>4042.578</td>
<td></td>
<td></td>
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</table>

Model II estimate of between component variance = 1274.71

Group: Count: Mean: Std. Dev.: Std. Error:

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<th>Std. Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>26</td>
<td>8.038</td>
<td>9.387</td>
<td>1.841</td>
</tr>
<tr>
<td>Group 2</td>
<td>19</td>
<td>-3</td>
<td>5.281</td>
<td>1.212</td>
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Comparison:

<table>
<thead>
<tr>
<th>Mean Diff.:</th>
<th>Fisher PLSD:</th>
<th>Scheffe F-test:</th>
<th>Dunnett t:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1 vs. 2</td>
<td>11.038</td>
<td>4.828 *</td>
<td>21.264 *</td>
</tr>
</tbody>
</table>

* Significant at 95%
### Somatic Anxiety Intensity

#### One Factor ANOVA $X_1$: Perform $Y_3$: SAI

**Analysis of Variance Table**

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<tr>
<th>Source</th>
<th>DF</th>
<th>Sum Squares</th>
<th>Mean Square</th>
<th>F-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>1</td>
<td>54.134</td>
<td>54.134</td>
<td>2.038</td>
</tr>
<tr>
<td>Within groups</td>
<td>43</td>
<td>1142.443</td>
<td>26.568</td>
<td>p = .1607</td>
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<tr>
<td>Total</td>
<td>44</td>
<td>1196.578</td>
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</tbody>
</table>

Model II estimate of between component variance = 27.566

<table>
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<tr>
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<th>Std. Error:</th>
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</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>26</td>
<td>16.885</td>
<td>4.546</td>
<td>.892</td>
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<tr>
<td>Group 2</td>
<td>19</td>
<td>19.105</td>
<td>5.896</td>
<td>1.353</td>
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</tbody>
</table>

**Comparison:**

<table>
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<tr>
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<th>Mean Diff.:</th>
<th>Fisher PLSD:</th>
<th>Schefte F-test:</th>
<th>Dunnett t:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1 vs. 2</td>
<td>-2.221</td>
<td>3.138</td>
<td>2.038</td>
<td>1.427</td>
</tr>
</tbody>
</table>

270
Somatic Anxiety Direction

One Factor ANOVA X₁: Perform Y₄: SAD

Analysis of Variance Table

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<thead>
<tr>
<th>Source</th>
<th>DF</th>
<th>Sum Squares</th>
<th>Mean Square</th>
<th>F-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>1</td>
<td>453.755</td>
<td>453.755</td>
<td>8.292</td>
</tr>
<tr>
<td>Within groups</td>
<td>43</td>
<td>2185.223</td>
<td>50.819</td>
<td>p = .0046</td>
</tr>
<tr>
<td>Total</td>
<td>44</td>
<td>2638.978</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Model II estimate of between component variance = 402.936

<table>
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<tr>
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<th>Mean</th>
<th>Std. Dev.</th>
<th>Std. Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>26</td>
<td>8.692</td>
<td>8.255</td>
<td>1.619</td>
</tr>
<tr>
<td>Group 2</td>
<td>19</td>
<td>2.263</td>
<td>5.173</td>
<td>1.187</td>
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</table>

Comparison:

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Mean Diff.</th>
<th>Fisher PLSD</th>
<th>Scheffe F-test</th>
<th>Dunnett t:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1 vs. 2</td>
<td>6.429</td>
<td>4.34 *</td>
<td>8.929 *</td>
<td>2.988</td>
</tr>
</tbody>
</table>

* Significant at 95%
APPENDIX 12

Analysis of Variance Raw Data Accompanying Table 4.5

Cognitive Anxiety Intensity

One Factor ANOVA $X_1$: Process $Y_1$: CAI

Analysis of Variance Table

<table>
<thead>
<tr>
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<th>DF:</th>
<th>Sum Squares:</th>
<th>Mean Square:</th>
<th>F-test:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>1</td>
<td>.024</td>
<td>.024</td>
<td>.001</td>
</tr>
<tr>
<td>Within groups</td>
<td>43</td>
<td>985.754</td>
<td>22.925</td>
<td>p = .9745</td>
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<tr>
<td>Total</td>
<td>44</td>
<td>985.778</td>
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</table>

Model II estimate of between component variance = -22.901

<table>
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<tr>
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<th>Std. Dev.:</th>
<th>Std. Error:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>34</td>
<td>20.235</td>
<td>4.85</td>
<td>.832</td>
</tr>
<tr>
<td>Group 2</td>
<td>11</td>
<td>20.182</td>
<td>4.579</td>
<td>1.381</td>
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</table>

Comparison: | Mean Diff.: | Fisher PLSD: | Scheffe F-test: | Dunnett t: |
<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1 vs. 2</td>
<td>.053</td>
<td>3.35</td>
<td>.001</td>
<td>.032</td>
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</table>
Cognitive Anxiety Direction

One Factor ANOVA \( X_1: \) Process \( Y_2: \) CAD

Analysis of Variance Table

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<tr>
<th>Source:</th>
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<th>Sum Squares:</th>
<th>Mean Square:</th>
<th>F-test:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>1</td>
<td>773.051</td>
<td>773.051</td>
<td>10.167</td>
</tr>
<tr>
<td>Within groups</td>
<td>43</td>
<td>3269.527</td>
<td>76.036</td>
<td>( p = .0027 )</td>
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<tr>
<td>Total</td>
<td>44</td>
<td>4042.578</td>
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</table>

Model II estimate of between component variance = 697.016

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<tr>
<td>Group 1</td>
<td>34</td>
<td>5.735</td>
<td>9.16</td>
<td>1.571</td>
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<tr>
<td>Group 2</td>
<td>11</td>
<td>-3.909</td>
<td>7.077</td>
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Comparison:

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<tr>
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<th>Fisher PLSD:</th>
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<th>Dunnett t:</th>
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<tr>
<td>Group 1 vs. 2</td>
<td>9.644</td>
<td>6.1 *</td>
<td>10.167 *</td>
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* Significant at 95%
Somatic Anxiety Intensity

One Factor ANOVA  X₁: Process  Y₃: SAI

Analysis of Variance Table

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<th>F-test:</th>
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</thead>
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<td>30.631</td>
<td>30.631</td>
<td>1.13</td>
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<tr>
<td>Within groups</td>
<td>43</td>
<td>1165.947</td>
<td>27.115</td>
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<td>Total</td>
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</table>

Model II estimate of between component variance = 3.516

<table>
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<tr>
<td>Group 1</td>
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<td>17.353</td>
<td>5.488</td>
<td>.941</td>
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<tr>
<td>Group 2</td>
<td>11</td>
<td>19.273</td>
<td>4.149</td>
<td>1.251</td>
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Comparison:  

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<th>Dunnett t:</th>
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</thead>
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<tr>
<td>Group 1 vs. 2</td>
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<td>3.643</td>
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</tbody>
</table>

274
Somatic Anxiety Direction

One Factor ANOVA $X_1$: Process $Y_4$: SAD

Analysis of Variance Table

<table>
<thead>
<tr>
<th>Source</th>
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<th>Mean Square</th>
<th>F-test:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>1</td>
<td>401.355</td>
<td>401.355</td>
<td>7.713</td>
</tr>
<tr>
<td>Within groups</td>
<td>43</td>
<td>2237.623</td>
<td>52.038</td>
<td>$p = .0081$</td>
</tr>
<tr>
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</tbody>
</table>

Model II estimate of between component variance $= 349.317$

Group: Count: Mean: Std. Dev.: Std. Error:

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<th>Std. Dev.</th>
<th>Std. Error</th>
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<tbody>
<tr>
<td>Group 1</td>
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<td>7.676</td>
<td>7.702</td>
<td>1.321</td>
</tr>
<tr>
<td>Group 2</td>
<td>11</td>
<td>7.27</td>
<td>5.293</td>
<td>1.596</td>
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</table>

Comparison:

<table>
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<th>Scheffe F-test:</th>
<th>Dunnett t:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1 vs. 2</td>
<td>6.949</td>
<td>5.047 *</td>
<td>7.713 *</td>
<td>2.777</td>
</tr>
</tbody>
</table>

* Significant at 95%
APPENDIX 13 - Modified Version of the Competitive Trait Anxiety Inventory-2

The effects of highly competitive sports can be powerful and very different among athletes. The inventory you are about to complete measures how you generally feel about competition. Please complete the inventory as honestly as you can. Sometimes athletes feel that they should not admit to any nervousness, anxiety or worry they experience before competition because this is undesirable. Actually, these feelings are quite common, and to help me understand them I want you to share your feelings with me openly. If you worry about competition or have butterflies or other feelings that you know are signs of anxiety, please indicate these feelings accurately on the inventory. Equally, if you feel calm and relaxed, indicate those feelings as accurately as you can. Your answers will not be shared with anyone. I will be looking only at group responses. Please remember that you are responding to how you generally feel about competition.

Directions: a number of statements which athletes have used to describe their feelings before competition are given below. The questionnaire is divided into 2 sections. Read each statement and then circle the appropriate number, in each of the two sections, to the right statement to indicate *how you generally feel*. There are no right or wrong answers. Do not spend too much time on any one statement, but choose the answer which describes your feelings right now.

When you have this thought/feeling do you normally regard it as negative (debilitative) or positive (facilitative) in relation to your upcoming performance. NB. If you have scored '1' (not at all) on the first scale, then respond in relation to that feeling e.g. If you respond 'not at all' to question 4, then you would respond on this scale as if you had no self-doubts.

<table>
<thead>
<tr>
<th></th>
<th>not at all</th>
<th>somewhat</th>
<th>moderately so</th>
<th>very much so</th>
<th>Very negative (i.e. debilitative)</th>
<th>Unimportant</th>
<th>Very positive (i.e. facilitative)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I am concerned about this competition</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
<tr>
<td>2. I feel nervous</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
<tr>
<td>3. I feel at ease</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
<tr>
<td>4. I have self doubts</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
<tr>
<td>5. I feel jittery</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
<tr>
<td>6. I feel comfortable</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
<tr>
<td>7. I am concerned that I may not do as well in this competition as I could</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
<tr>
<td>8. My body feels tense</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
<tr>
<td>9. I feel self-confident</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
<tr>
<td>10. I am concerned about losing</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
<tr>
<td></td>
<td>not at all</td>
<td>somewhat</td>
<td>moderately so</td>
<td>very much so</td>
<td>Very negative (i.e. debilitating)</td>
<td>Unimportant</td>
<td>Very positive (i.e. facilitating)</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>------------</td>
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<td>---------------</td>
<td>--------------</td>
<td>-----------------------------------</td>
<td>-------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>11. I feel tense in my stomach</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
<tr>
<td>12. I feel secure</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
<tr>
<td>13. I am concerned about choking under pressure</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
<tr>
<td>14. My body feels relaxed</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
<tr>
<td>15. I am confident I can meet the challenge</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
<tr>
<td>16. I am concerned about performing poorly</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
<tr>
<td>17. My heart is racing</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
<tr>
<td>18. I'm confident about performing well</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
<tr>
<td>19. I'm worried about reaching my goal</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
<tr>
<td>20. I feel my stomach sinking</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
<tr>
<td>21. I feel mentally relaxed</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
<tr>
<td>22. I'm concerned that others will be disappointed with my performance</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
<tr>
<td>23. My hands are clammy</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
<tr>
<td>24. I'm confident because I mentally picture myself reaching my goal</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
<tr>
<td>25. I'm concerned I won't be able to concentrate</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
<tr>
<td>26. My body feels tight</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
<tr>
<td>27. I'm confident at coming through under pressure</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
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</tbody>
</table>
APPENDIX 14

Swimming Involvement Progression Questionnaire

Year(s) at Phase | Characterised by:
--- | ---

Phase 1 (Getting involved in swimming)
Began ____ | - Group lessons.
To ____ | - Practising usually once a week.
- Doing other activities except swim.

Phase 2 (Beginner to intermediate-increased commitment to swimming)
From ____ | - Increase in amount of swimming and related activities.
To ____ | - Swimming took up more of your time.
- Began competitions.
- Increased time & money involved.

Phase 3 (Intermediate to Elite-fully committed to swimming)
From ____ | - Further increase in amount of swimming & related activities.
To ____ | - Swimming took up almost all of your time.
(Present day) | - Began competitions at higher levels.
| - Further increase in time & money involved.

# of hours per day ____
# of days per week ____
# of weeks per year ____

| Level | Years Competed | Level Of Achievement | Year Achieved |
|-------|----------------|----------------------|--------------|-------------|
| Junior | ________ | County | ________ | District | _____ | Nationals | _____ | Internationals | _____ |
| Senior | ________ | County | _____ | District | _____ | Nationals | _____ | Internationals | _____ |
| | | Commonwealth Games | | European Championships | | Olympics | | World Team | |
APPENDIX 15

Interview Guide for Study 3

Elite Competitive Swimmers

Interview Guide

Subject # Name: Age:

Date: Time Began: Time Ended:

SECTION 1
INTRODUCTION (Not Recorded)

Hello, I'm Sheldon Hanton from the Department of Physical Education, Sports Science and Recreation Management at Loughborough University of Technology. Thanks for agreeing to participate in this interview study. In this project I am talking to elite competitive swimmers, and looking at how top level performers have acquired and developed the mental skills and strategies which enable them to interpret their thoughts and feelings prior to racing as positive and facilitative. Additionally, I am interested in what exactly elite swimmers do now to maintain this interpretation.

Therefore, the purpose of this study is to better understand some of the mental aspects of elite competitive swimming. The idea for the study actually came from the previous research we have conducted at Loughborough University regarding certain psychological differences between highly skilled and less highly skilled performers. I want to learn in greater depth about your pre-race mental strategies so that I may be able to help swimmers and coaches prepare for competition in the future.

The information from this study will be used in two ways: First, the information will be used for my own Ph.D. research thesis. Second, the results will be published in scientific journals so that other sports scientists, coaches, and swimmers can benefit from them.

I would like to emphasise that your interview information will remain completely confidential. I may want to use selected quotes from the interviews in order to illustrate important ideas but these will remain strictly anonymous, and I will ensure that your identity is protected. I am using a tape recorder to get complete and accurate information, and to make the interview process more
efficient. The tape recorder is also necessary so that I will be able to make a typed transcript for later scrutiny and reference.

As a participant in this study you have several very definite rights. First, your participation in this interview is entirely voluntary, and you are free to decline to answer any questions or to stop the interview at any point. There are no right or wrong answers to the questions that I will be asking. I want to learn and benefit from your experience and expertise so that I can better understand what it is like to be involved in senior elite swimming at a very competitive level. I hope, therefore, that you will answer the questions in a candid and straightforward way. If there are any questions you do not feel comfortable answering I would rather you declined to comment than to tell me what you think or what you think I or others want to hear. So if you would prefer not to answer a question, simply state "no comment", and no further questions related to that topic will be asked.

If you have any questions as we go along please ask them as is the case for clarification. If at any time you do not understand what I am asking.

ORIENTING INSTRUCTIONS: There are two things I need you to keep in mind throughout the interview.

First, I will be asking you about your experience as an elite competitive swimmer. I know that you are still competing competitively so I will be asking you to think back to the time when you may not have been competing at elite standard. Since you may have to think back in time, you might not be able to immediately remember some things. Take your time as you try to recall the past; pauses are fine. If you still can't remember after trying to think back, then just let me know, but please don't guess.

When you are doing this recall, keep in mind that I am interested in your overall experience as a competitive swimmer, both in and out of the pool. So in your answers you can draw on any and all aspects of your experience as a competitive swimmer. This could include things in and out of the pool that were related to your swimming experience such as lessons, examinations, relationships, interactions with other people or anything else that is important to your experience in swimming as they pertain to the issues that we will be discussing.

The interview contains several parts progressing through your swimming career from the time you first became involved with the sport up to the present day. At the end of the interview there will be an opportunity for you to add anything that you felt was important and not covered in the interview.

Do you have any questions now about what I have talked about so far? OK, then let's get started.
SECTION 2

EARLY EXPERIENCES

Introduction:
To better understand your development & commitment as an elite swimmer, a swimming specific 'Involvement Progression Questionnaire' has been developed which you have completed and we have discussed. This breaks the competitive career down into 3 main phases, from when you first became involved in swimming until now, the present day when you are competing at elite standard.

To put things in the appropriate perspective, we will start with the process that you went through in initially getting involved in swimming. If you refer to Phase 1 of your 'Involvement Progression Questionnaire' we can talk a little more about your early experiences.

Interview Questions:

(1) How old were you when you first began swimming (taking lessons, etc.)?

(2) Who first got you involved in swimming?
PROBE: Parents, Brothers etc. Did they also used to swim?

(3) Did you join a teaching group or did someone else teach you to swim?

(4) How many times approximately per week did you swim at this time?

(5) Did you enjoy swimming in these early stages?
PROBE: If YES / NO why?

(6) Did you take part in any other activities apart from swimming?
PROBE: Sport related, Non-sport related?

(7) Did you take part in any of these activities competitively?

(8) Did you enjoy any of these activities more than swimming?
PROBE: If YES, why did you continue swimming?
PROBE: If NO, was swimming your favourite activity as you found that you were good at it?

SECTION 3

PHASE 2: INCREASED COMMITMENT TO SWIMMING

Introduction:
Now that we have briefly discussed how you got involved in swimming in the first place, we can move onto the main areas of this interview. Namely, when your involvement level progressed and you started to become more committed to your swimming. Please refer to Phase 2 of the 'Involvement Progression Questionnaire' at any time during this part of the interview. Please try to stay focused from the ages of _____ to _____ in this phase throughout the following questions. Also
remember to take your time in answering the questions and, let me know if you really can't remember rather than guess.

Interview Questions:

(1) How old were you when you began participating in competitive swimming (e.g. racing at weekend galas, Club Champs etc.)?

(2) How often did you compete?

(3) Did you ever swim "up" (e.g. swim 12's when only 10) an age group in any of these competitions? 
PROBE: How far "up"?

(4) How many times per week were you now swim training?

(5) Approximately how much training did this involve?

(6) Did this include any morning or land training sessions?

(7) Which club(s) were you now a member of?
PROBE: Did you change clubs at all during this phase?
PROBE: If YES / NO Why?

(8) Were you the best swimmer in your club during this phase?
PROBE: If YES, at what events etc.?
PROBE: If NO, who was & why etc.?

(9) Did the other activities (sports or otherwise) that you spoke about in Phase 1 continue?
PROBE: If YES, why

EARLY COMPETITIVE FEELINGS

Introduction:
Now that we have talked a little bit more about your increased involvement in swimming, I want to focus in on the thoughts and feelings you may have experienced when you actually started competing. Remember to try and stay focused in Phase 2 between the ages of ___ and ___ and not how you think now.

Interview Questions:

(1) My first question for you, then, is did you enjoy competing at this time?
PROBE: If YES, why was it enjoyable?
PROBE: If NO, why?

(2) Tell me a little about the kind of thoughts and feelings you experienced when you started competing? Also what kind of symptoms did you tend to experience with these thoughts and feelings before you raced?
PROBE: Mental symptoms / Physical symptoms.
PROBE: Did you interpret these symptoms negatively or positively towards your race & why?
PROBE: Did you feel under any sort of pressure at all when you started racing?
Parents, Coach, Team-mates?
PROBE: If NO, why?
(3) Were there any races you remember that particularly affected you, i.e., that your pre-race thoughts / feelings, & the resultant symptoms were particularly intense? Can you tell me about the race.
PROBE: How did these symptoms affect you?

(4) Did you try to do anything about it?
PROBE: Did you just learn to live with it?
PROBE: Did you ask anyone for advice?

(5) When, if at all, during this time period did the thoughts & feelings you felt prior to competing turn into what you perceived as anxiety (i.e., at what age/level)? By anxiety, I mean any kind of negative response or reaction (mental & physical).
PROBE: How did you overcome this anxiety?

(6) Did your thoughts & feelings before a race change over this time period?

SECTION 4

PHASE 3 : FULLY COMMITTED TO SWIMMING / WHAT DO YOU DO NOW?

Introduction:
The next part of the interview focuses on the period in your life when you became fully committed to your competitive swimming from the age of up to the present day. This phase of your career is characterised by swimming taking up most if not all of your spare time, when you started to compete at higher and higher standard competitions. We will be discussing in greater depth your mental strategies and techniques and what exactly you do now that you are an elite competitor. Again please refer to Phase 3 of your 'Involvement Progression Questionnaire' at any time during the following questions.

Interview Questions:
Now that you were fully committed to swimming, let me ask you some similar questions to before about your training.

(1) How many water sessions did you train per week?
PROBE: Mornings, land training?

(2) How long on average were your training sessions (more intense)?

(3) Did you take a break from swimming at any times during the year?
PROBE Swim through exams?

(4) Did you have any other interests during this time apart from swimming?

If we look at your 'Involvement Progression Questionnaire' I see that you competed at County, District, National & International levels (as appropriate) as a Junior
between the ages of _____ and ____. If we concentrate solely as a Junior for the time being.

(1) Were there any differences in the intensity (i.e. the amount) of your pre-race thoughts & feelings when the standard of the competitions increased?

(2) Can you tell me a little about the symptoms that you experienced now that the races were of a higher standard? (Mental / Physical)

(3) Did you ever perceive the symptoms associated with these thoughts & feelings as anxiety?

(4) When you experienced these symptoms as a Junior, did you generally interpret them as being positive or negative towards the race that you were about to compete in?
   PROBE: Which symptoms (mental or physical) did you interpret as the most positive/negative?
   PROBE: If negative, why do you think this happened?
   PROBE: How do you think this interpretation affected your performances?
   PROBE: What did you do about this? (physically & psychologically) to turn this around to perceive it positively?

(5) How did you try to deal (cope) with these symptoms? For example, you mentioned that you _______________ (felt extreme sickness in the pit of your stomach), how did you deal (cope) with these symptoms before your race?

Regarding your time as a Senior, I see that you competed at County, District, National & International, and took part in the Commonwealth Games, European Championships, Olympics and World Championships (as relevant). Concentrating on your Senior career.

(1) As you moved into the senior ranks of competitive swimming, were there any differences in the intensity of your thoughts & feelings before your races than when you were a Junior.

(2) What symptoms did you experience now? and how did you now interpret these symptoms. Can you explain to me if you felt they were positive or negative towards your upcoming race?
   PROBE: If negative, how have you now managed to turn them to positive?

(3) We discussed before that as a Junior you did /did not (as appropriate) interpret these pre-race symptoms as anxiety. Was this also the case when you became a Senior competitor and the competitions became even more intense?

(4) When you experienced these symptoms, did you generally interpret them as being positive or negative towards the race that you were about to compete in?
   PROBE: Which symptoms (mental or physical) did you perceive as the most positive.

(5) How did you cope with these pre-race symptoms?
PHASE 3: FULLY COMMITTED TO SWIMMING / WHAT DO YOU DO NOW?

MENTAL SKILLS TO MAINTAIN FACILITATION

Introduction:
Just focusing on the area of mental techniques and mental preparation strategies now. I'd like to concentrate more specifically on the mental skills that you to maintain facilitative interpretations of your pre-race thoughts and feelings. Remember, take your time in answering these questions.

Interview Questions:

(1) What kind of mental techniques and strategies do you use to maintain positive interpretations of your thoughts and feelings prior to racing?
PROBE: Do you have a set psychological routine that you now follow?
Pre-Competition Plan?
Competition Focus Plan (Focusing & Refocusing Techniques)?
Plan for Dealing with Uncontrollable Distractions (Unforeseen events)?
Imagery: Internal/External?
Goals setting: Long/Short term; Performance, Outcome & Process?
Relaxation: Mental/Physical?
Concentration skills: Focusing and Refocusing (Distraction Control)?

(2) How do you use them, can you elaborate?

(3) Are any more important than others?

(4) Were they always present? Have you always been able to do they naturally?

(5) If not, how were they developed?
PROBE: Were you educated by any of the following: sport psychologist, coach, other swimmers?

(6) Did you have to practise these mental skills?

(7) If yes, when and how often?

(8) How have they been refined?

(9) Have the skills changed over time?

(10) How successful were you at employing these mental skills

(11) Do the skills you use every alter?
PROBE: Standard of the competition?
Training cycle?
Event to be swam?
Heat/Final performances?

(12) Do you find it tiring to prepare psychologically for a race?

(13) Do you now still practise the mental skills?
PROBE: If yes, when, and how frequently?

(14) Do you still experiment with different mental skills?
(15) Do you mentally prepare for training as well as competition and possibly use these strategies in training?

SECTION 5: ADVICE FOR OTHERS

Introduction:
I would like you to use the valuable information that you and other elite swimmers are providing me with, to perhaps aid other swimmers and their coaches in their mental preparation strategies and approaches to competition. Specifically, to help develop positive interpretations of thoughts and feelings prior to racing.

Interview Questions:

(1) If you were coaching and a member of your team was suffering from negative interpretations of pre-race thoughts and feelings, what advice would you give them?

SECTION 6

CONCLUSION

This just about raps up the interview. However, before we finish, let me ask you some final questions.

(1) How did you think the interview went?
(2) Did you feel that you could tell your story fully?
(3) Did I lead you or influence your responses in any way?
(4) Do you think we failed to discuss any important factors?
(5) Have you any comments or suggestions about the interview itself?

Thanks for helping out with this interview.
APPENDIX 16a

Interview Transcript Example - Study 3 - Subject 6

PHASE 1

EARLY EXPERIENCES

SH: OK, so to better understand your development and commitment as an elite swimmer, we have developed a swimming progression questionnaire which charts through the phases your career, through three separate phases from the time you first got into the pool to the time now when you're one of the best swimmers in the world. You have already completed this and we have talked about the phases before. So to put things in the appropriate perspective we'll start with the way you actually got involved in swimming in the first place. So how old were you when you first began getting in the pool?

S6: I was actually a number of months, and you know, as a very young baby, but I could actually swim from the age of three.

SH: Right, from the age of three. And who first got you involved in swimming?

S6: And that was my mother, she just thought it was important to learn to swim for safety reasons, and that was basically the only reason.

SH: Did your brothers or sisters used to swim?

S6: No, I don't have any brothers or sisters.

SH: Don't have any brothers or sisters. And did you join a formal teaching group?

S6: No, no I didn't, erm, we used to go every week, wind, rain, hail or snow, and just really had a fascination with water as a kid, just couldn't keep away from it really.

SH: Like fatal attraction to water?

S6: Yes, yes.

SH: And roughly how many times a week did you swim on average during this phase?

S6: Well, I would say on average, once a week.

SH: Once a week, at night?

S6: Gosh, no it would have been sort of late afternoon.

SH: So you definitely enjoyed swimming, but did you do anything else apart from swim, did you do any other sports or any other musical instruments, plays?

S6: This to the age of nine?

SH: Yes.
S6: Well I joined a club when I was eight.

SH: Right.

S6: So that was a bit of a turning point.

SH: Yes.

S6: In 1975, and I was just a really, really active child, erm, and although I wasn't in another club I did a lot of sports for fun like cricket, football, tennis but this was just with my mates off the street. We would go down to local Arberes where they had tennis courts and pitches, so I was sort of multi sports really, but the one I had the most passion for was swimming and that's the only sport I did outside of actual school activities if you see what I mean.

SH: OK, and you obviously really enjoyed these other sports, and did you do them competitively?

S6: Erm, no, I would say, the only one I did competitively was running, and that was just at school. Again nothing else outside of school. I mean I ran west Midlands schoolboy championships and things like that.

SH: Right, but there was never any contest between what sport you should actually peruse?

S6: No because swimming was the one I loved the most, it just seemed quite natural for me to peruse that.

SH: OK excellent.

PHASE 2

INCREASED COMMITMENT TO SWIMMING

SH: Now that we have briefly introduced how you got into swimming in the first place, we will move on to the time when you became slightly more committed. Specifically, when your involvement increased and you were more committed to your swimming. Also (subjects 6) to let me know if you can't remember, but take as much time as you want, there's no rush. So how old were you when you first began competing at weekend galas, club championships?

S6: Erm, well funnily enough, Ill just say this first, I retired at ten.

SH: Something not a lot of people know.

S6: I was in Walsall swimming club from 75 and for two years was taught the techniques of the strokes, and it was fun, had fun in water doing drills, doing widths, nothing strenuous, and all of a sudden I was put in a club situation where it was competitive, it was training every day, it was competitions at the weekend, something I wasn't used to, and couldn't really cope with that. I was at the back of the lane, in lane one, and if you imagine doing kick sets, pull sets, from a tuition group really, although it was advanced tuition because we were being taught the correct techniques, you know I could
already swim. So I actually quit early in the 75 and went back in the September of 75, and all of a sudden for some reason I was moved up in to lane three. I don't know whether I had grown a lot in those six months and my encouragement to go back was beating a school friend who was one of the top club swimmers, but on butterfly, I happened to beat him on breaststroke but that didn't really matter.

SH: Yes.

S6: So that gave me the confidence to go back, and within six months of going back in September 75 I got my National Age Group qualifying time.

SH: Right.

S6: So there was a very short phase of not wanting to do it and then all of a sudden being on the blocks at National championships.

SH: I see.

S6: And that was just confidence, either a lack of confidence and then in the end great confidence to carry on, and realised I had the ability to do quite well.

SH: Quite unusual?

S6: Yes.

SH: Unusual for that kind of thing.

S6: It was a strange situation to be in, yes.

SH: And roughly how many times were you competing during this phase. Were you competing virtually every weekend?

S6: Erm, I was competing probably every, it was probably worse then than it is now. Certainly once a fortnight, and I would probably say, yes, once every single weekend, whether it was a county or club event or league event. And that was at eleven, because I was eleven in January 78, so when I was ten although I started competitive swimming it really wasn't that functional.

SH: OK, and how much training were you doing at this time?

S6: Just twice a week.

SH: Not very much really. Did it include any mornings.

S6: No, no.

SH: What age was your first morning?

S6: Fourteen.

SH: And what club were you a member of?

S6: That was Walsall.
SH: Did you change clubs during this time?
S6: No.
SH: Were you the best swimmer for your age?
S6: Yes, yes, at breaststroke, that's breaststroke.
SH: By quite a long way?
S6: Yes, I think it took the club by storm when I came in as an unknown and beat their top breaststroker at eleven, and all of a sudden it was, who is this guy, so I had a lot of experience as it gave me all the galas.
SH: Did you continue with the running?
S6: Yes, I ran probably right up until that eighteenth, nineteenth year.
SH: O, right.
S6: As part of my training programme then, I didn't run competitively after the age of fifteen. When I say competitively I mean throughout the region of schools, inter-schools championships or whatever.
SH: So you weren't in an athletics club?
S6: No I wasn't in an athletics club.
SH: And during this time (Subject 6) did you have to swim against kids who were older then you, ie. swim up an Age group?
S6: Not really, as there were a lot of swimmers at our club, so the events were spread out pretty evenly throughout the age groups.

PHASE 2

EARLY COMPETITIVE FEELINGS

SH: OK, now we have talked a bit about the training and the background, Im going to ask you about the thoughts and feelings you may have experienced when you first started competing. Try and stay focused in phase two again and take as much time as you want to think back. OK. So my first question is, did you enjoy competition between the ages of ten and fifteen? I know its quite a broad time frame but its so that we just have something to focus on, so did you enjoy competition?
S6: Yes, immensely.
SH: Immensely, why was that do you think?
S6: I think the excitement, the pressure, I seemed to, erm, although I had the butterflies in my stomach just like every other kid, I realised that whenever I did and whenever the greater the occasion, I always seemed to swim faster.
SH: Right, that's interesting because that's led me onto my second question, which is the kind of thoughts and feelings you experienced before a race. Can you tell me a little about them?

S6: Yes, I used to get terrible butterflies when I started which I didn't like at all. But, I can always remember saying to my mother that "I feel sick and I don't like it". This was when I wake up in the morning before a gala, "feel sick mum", and she said: "well, what have you got to worry about, you have got everything to gain and other people will be more worried than you are" because it was all new to me and I had nothing to loose.

SH: OK.

S6: So those words of confidence have never really left me.

SH: Right. Did you have any other physical symptoms apart from the sick feeling and the butterflies?

S6: No, no.

SH: And what kind of things used to go through your head before your race at this time? What kind of things did you used to think about, erm, when you first started competing? You were obviously very excited and enjoyed it a lot, but can you remember back to the kind of things you may have thought of?

S6: Its a lot of years you know.

SH: I know that, this is the difficult bit, the next phase is a little easier, this is the difficult bit. If you can't remember there's no problem.

S6: I always remember being terribly, terribly competitive, and erm, I think my races were quite erratic. I might either go out remarkably fast and hang onto win, but usually I would go out slow and try and belt it back.

SH: Right.

S6: I was a bit of a sprinter and could never do, probably because of the lack of training, anything more than two lengths, I'm talking about a thirty six and two thirds yard pool. So I suppose I used to worry a bit about how I would perform in the first part of the race, because I knew I hadn't done enough training.

SH: Yes.

S6: But I always, always remember feeling a great challenge, and whoever was next to me, I realised they were better, because nine times out of ten they were.

SH: Right.

S6: I got such a buzz from winning, because I was always the underdog as a kid.

SH: These physical symptoms that you used to have before a race, the physical symptoms, did you think they were a good or a bad think towards the race you
were about to compete in. So were these feelings positive or negative towards your race?

S6: I would say it was a good thing. Let me think

SH: No problem

S6: Yes. A good thing, they were positive, I grew to take them for what they were and that was good.

SH: OK, so that's the physical symptoms, what about the thoughts you had before the races, were they a good or a bad thing, you know thinking about how you would swim?

S6: Erm, yes, good also as I suppose it meant that the race was kind of important to me. I suppose I quickly learnt, especially with the kind of things that mum said to me, her advice, that they were natural, so I just accepted that.

SH: You mentioned pressure. Did you feel under any pressure?

S6: Probably the occasion, and er, pressure from within me to do well.

SH: Right. OK, and were there any particular races that you can remember that particularly affected you, where the intensity or the amount of your pre-race feeling was quite high? Was there any one race that stands out at a young age?

S6: Always the National Age Group Championships. I think there is immense pressure there, and its all relevant. I do believe there is no more pressure at an Olympic Games than there is at an age group final. Because standing on my blocks racing at the National Age Group Championships at 78 as an eleven year old, I had no experience whatsoever, and I couldn't relate to anything.

SH: Right.

S6: Yet, when you stand on your blocks at the age of twenty one or twenty five in the Olympic final, erm, a minute away, you've got perhaps ten years of experience you can perhaps pull in.

SH: That's right.

S6: And use to control the situation that you are in, its all relevant really, and I felt erm, because my careers been very progressive.

SH: Right.

S6: And I wasn't world champion at eighteen, or anything silly like that, that it has given me a stable frame of mind.

SH: And at the nationals how did this pressure affect you?

S6: Same as before, the butterflies, feeling a bit sick in the stomach, and I did still think a bit about how I would swim in the race.
SH: Did you try and do anything about it?

S6: Not really, as I said before, just accepted it and tried to use how I felt to make me actually go faster in the race.

SH: Right, OK. During this time period of ten to fifteen, would you ever say that you suffered from anxiety before your races?

S6: No.

SH: Would you have labelled it as anxiety?

S6: No, no, there's a very fine line, isn't there, between anxiety and erm, excitement.

SH: Can you elaborate?

S6: I think probably, when I do my best performance I'm very close to that line. And I think I usually always am in a pressure situation very close to that line. So it wouldn't probably take much to fall over the top, topple over.

SH: That's interesting.

S6: I think that actually spans right the way back to the early years.

SH: Lastly in this bit (Subject 6), did your thoughts and feelings change over time, before you races?

S6: Only to a small degree, you just get a bit more experienced, pick up things from other people, I enjoyed it really.

SH: OK great, here have a drink

S6: Cheers.

SH: Do you want a quick break?

S6: I'm fine.

PHASE 3

FULLY COMMITTED TO SWIMMING

SH: Right, if we move onto phase three which should be easier to remember, this is characterised by when you became fully committed to swimming, you know, it taking up virtually all of your time and you were competing at higher and higher standard meets. So we are talking about from the age of fifteen up to the present day. Look at you involvement questionnaire as often as you like and try and stay focused in this phase. We will be talking more about mental strategies and your thoughts and feelings. So how much training were you doing during this phase now, on average?
S6: Yes. I was probably going training seven times a week.

SH: For how long?

S6: Hour and a half each session.

SH: And this included mornings now?

S6: Yes, two mornings.

SH: Any land work?

S6: Yes, twice a week, Tuesday and Sundays. But it was literally land work, sit ups, press ups, squat thrusts, running.

SH: Not a structured weights?

S6: Wasn't weights.

SH: OK, and did you ever take a break from swimming from the ages of sixteen to twenty seven?

S6: Yes, when you say a break you mean more than a month?

SH: Yes, I mean for example, did you swim through your exams, your 'O' levels?

S6: Yes, yes.

SH: You carried on competing?

S6: Yes.

SH: I wondered if you have ever taken more than a month or so out?

S6: Yes, the longest break I had was after the Olympics in 88, I had six weeks out.

SH: Right, and what did you do during those six weeks, did you keep fit at all?

S6: No, nothing.

SH: Just had fun.

S6: Yes.

SH: Looking at.

S6: I was probably writing off for sponsorship.

SH: Getting some cash. Here's my medal give us some money.

S6: You know it well, yes for about nine months.
PHASE 3

JUNIOR

SH: If we focus solely as a junior for the time being, up to the age of, sixteen this kind of thing. I see that you competed right up to international standard. When you started as a junior competing as an international, did you feel differently before your races? Was there like a greater intensity of, like your thoughts and feelings and the symptoms you experienced because of these?

S6: Not really overall, but I remember swimming the European junior championships in 83.

SH: Right.

S6: I was on the youth squad throughout 83, I qualified in the 82, and for some reason the next thing I was on the blocks swimming the final at the European junior championships. I had trained like hell for the two months before it and kept trying to get the time, the qualification time which I did and made the final, but again as I was under immense pressure from within me to do very well. In a pressurised situation, it was a situation that was presenting itself as overwhelming.

SH: Right.

S6: I performed a lifetime best again by some two seconds, you know.

SH: How did you do?

S6: I came sixth actually, but I went from a 2.31 to a 2.29. I just kept finding it remarkable that in those pressurised situations I could control my mental state to perform better than my best. And at that age I don't really know how I did control it. I think I just soaked in the atmosphere and although there was a certain amount of anxiety because I wanted to do well, but it was always positive, I feel and that's probably why I did well. But generally, the symptoms were the same as when I was a bit younger.

SH: This is great stuff (Subject 6), I mean your answering a lot of my questions before I've asked them. So you would feel you were in control?

S6: Yes. Yes, I was.

SH: In control of like your physical feeling and your mental state as well?

S6: Yes, I was shaking, but I was in control as well.

SH: So the symptoms were pretty much the same?

S6: Yes, there wasn't much change really, I don't think you develop new ones.

SH: Did you see the symptoms as positive again?

S6: Yes, definitely, that right, both the mental and physical side I enjoyed.
SH: Did you feel that the mental thoughts you had or the physical were the most positive for the upcoming race?

S6: Probably about the same, the butterflies in the stomach and the shaking, and all the rest of it. Yes, that's for sure, but in terms of physical preparation, what gave me the stable frame of mind was probably a couple of days leading up to the event, the warm up before the final and... and those vital moments that do set you up getting your pace right. Those are the sort of things that would give me the stability, and I think if there not there I do have certain doubts, just like anyone would really.

SH: And how would you deal with that, if you had these certain doubts shooting into your head, certain doubts?

S6: I think then you just have to rely on the race situation and go, go with the race itself, however it may materialise, erm. To a certain degree I always have a race strategy, but I think if, your preparation hasn't been that good you are probably more aware of your weaknesses than your strengths.

SH: That's right.

S6: I know weaknesses isn't a word you should really use, erm, so I think you have to rely more on the race situation and be more aware of the individuals around you. Because I normally do all the mental rehearsal is seeing myself perform to the ultimate and better than my best, and just achieving something that I have always wanted to. It doesn't see me beating Mr X or whoever is next to me. I don't rehearse winning or beating a particular individual. I just see myself swimming with good control and good technique, good pace and producing an ultimate time that should win the race.

SH: So you use full mental imagery techniques?

S6: Yes.

SH: When you imagine yourself swimming, do you imagine yourself as if you are swimming yourself or watching yourself on TV?

S6: Both really, I see myself do it, I watch myself, but I can also feel it at the same time. Its something that I suppose I have practised quite a bit.

SH: So you get like kinaesthetic feelings?

S6: Yes.

SH: Do you ever get like when you get a rush of adrenaline?

S6: O yes, my heart rate is up to about 170.

SH: OK, so you are obviously well practised in these skills. Have you ever tried to reduce these feelings, as a junior, did you try and reduce these feelings you had before a race, or did you, because you said you have always perceived them very positively or did you just accept them?
S6: I just accepted them, I didn't see any reason why I should try and repress anything. It seemed to be the norm, everything was new and I just went with the flow. Funny really, I learnt quickly, much faster than a lot of people I knew that if I felt the way I did I knew I would swim well. I suppose really I listened to the right advice from my mum and coach and that sort of thing as to how I felt.

SH: OK, you said before that you didn't really think you were experiencing what you would have labelled as anxiety, what about at this time?

S6: Not really anxiety as I never saw it as a bad thing, no matter how I felt, even if the symptoms made me uncomfortable I just got on with it and tried to use them to the best of my ability.

PHASE 3

SENIOR

SH: We will move on to your time as a senior swimmer now, between the ages of sixteen and the present day and you have competed at all the major championships. As you competed at these higher and higher standard competitions, did you feel any differently before your races as to how you felt when you were like a junior international?

S6: I don't think I did no.

SH: Roughly the same?

S6: Yes, genuinely, yes. As I said it all relevant, I could rely on a lot of experience from all sorts of situations.

SH: Used to draw on your past experiences. Is this how you used to keep your confidence levels high?

S6: Yes definitely.

SH: And if you had a minor drop in confidence, what kind of things would you think about to try and get your confidence back up?

S6: There are so many different factors really. Confidence could be knocked from a number of situations that didn't go right throughout the course of the year. But then you can always pick out positive points from bad situations. It might be that I'd had a below par National Championship, but when it came to the main championship of the year my pace work was spot on and because of that I knew I was going to perform well rather than worry about what happened at Nationals. You know I would be plucking that out of the final preparation phase, or vice versa. If I feel my pace wasn't so good today, then I know that I swam very fast at National Championships so I know no reason physically why I should swim any slower.

SH: So at the main championships, its like self reinforcement from previous experience?

S6: Exactly, yes.
SH: Did you still interpret these feelings and symptoms before a races, even at the major championships as very positive? So the butterflies in the stomach, the sickness feeling, did you still see that as a very necessary and positive part of getting ready for the race?

S6: I feel even now, if I line up on the blocks and I'm not nervous, I know its not going to happen. I mean I might win but I might be ten seconds off my best time. But again I don't really perceive anything I think or feel as negative, its not anxiety, its pressure but it has to be there or I know I wont perform.

SH: For example, do you still get nervous at say, tomorrow for your 200 breast?

S6: I wouldn't have been, I wouldn't have been at all, but because the whole programme has been stimulated by invites from abroad, and you have got people like John Cleeveland and Steph Van Neerden here, and they are all shaved down, and all our own competitors have shaved down. And when I find myself in a situation where we are building for the Olympics on about you know, I was sixteen per cent body fat. Its coming down all the time, Im down to about twelve now, erm Im not going to shave so all of a sudden Im at a disadvantage so its a challenge, and its a challenge I like all the time. I might loose, I don't know, Im quite sure I'll swim very well because I can rely on all these years of experience and its not going to look good if I loose on national TV, being Commonwealth Champion. So all these external pressures if you like are stimulating me. I wouldn't have had any internal pressures at all, and the greatest pressure always with me is internal pressure but at the moment its external pressure. External pressure here is actually motivating me to do well.

SH: And we discussed as a junior that there was this fine line between excitement and anxiety. Do you still feel that's the case as a senior?

S6: Yes, definitely.

SH: What about control? Do you still feel as though you are very capable and confident of remaining in control in these high pressure situations as a senior?

S6: Yes, my only concern is that more things can go wrong now at my age. I hadn't had one single injury up to 92 and then three times in that year my groin went, since then I've had a prolapsed disk in my back, I've had something wrong with my joint and a slip disk in my neck. And Im just thinking, what next? So I think you can only do as much as the body will allow, and I think that's more of a concern that I could train hard all year, and two days before a race something could happen. I could get out of bed and my back could go, and that's an anxiety.

SH: That's an anxiety. Its a different kind of anxiety though, isn't it?

S6: Yes, yes.

SH: Its not like a competition anxiety?

S6: No, no.

SH: And how do you try and deal with that?
S6: You have just got to have faith. I've had to find more time, erm, I've had to find time for treatment, find time to do a better flexibility programme, I've had to find more money from somewhere to pay for all the treatment and just be very aware that my body isn't growing anymore. I think that when the body is growing it can take more knocks and recover more quickly than it does when it stops growing for some reason. That's what the experts say, and I was only told that yesterday. So at twenty seven, twenty eight next month, I'm just hoping the next eighteen months are going to be kind in terms of injuries.

SH: Right. I wish you the best of luck.

PHASE 3

MENTAL SKILLS FOR FACILITATION

SH: We're going to move on to another section on mental skills. Basically, I would like to discuss the type of skills and strategies that you use to maintain this positive interpretation of how you feel before you race. You said that apart from not liking the butterflies and that kind of thing when you very first started out that you interpreted your thoughts and feelings as positive. I would like to discuss what you do now to keep this positive interpretation.

S6: I follow a very exact routine. I suppose I place a lot of emphasis on my psychology and have done for a long time. It's difficult to single out any specific skills and just like in the water, all the mental skills fit together to form an end product which then helps keep a positive perspective.

SH: Can you tell me a little bit about the things you use then (Subject 6)?

S6: I do a lot of mental rehearsal. At first it's always very er, I was going to say spontaneous, I could be driving a car and it would be just coming in a flash. I could see myself on the blocks diving in at Commonwealth Games and I could dismiss it straight away. My heart rate might go up to about 170 in a couple of seconds. So the mental rehearsal could just hit me at any point in the day and as I said, I could even be driving the car. But as I get closer and closer to the event or closer to race day, so my event seems to pan out. It becomes a lot more clear, and where as it might have been just the first fifty, it establishes itself into a full two hundred breaststroke with stroke count, feel of the event, adrenaline surge, and I see myself doing the whole event and achieving exactly what I want to achieve.

SH: OK.

S6: And an interesting point, the final mental rehearsal will be done the day before, erm, the event itself. Probably early evening and then that would be it, and I wouldn't go over it again or think about it again. And hopefully it has been done well enough to go on auto pilot. Once I'm in the ready room, once I'm behind the blocks, on the blocks then as far as I'm concerned it just happens.
SH: OK, so you're not one of these swimmers who will do mental rehearsal after the warm up prior to the race.

S6: No.

SH: That's interesting.

S6: I also try and learn from my races and evaluate the races after, both good and bad ones.

SH: Would you ever sit down and write?

S6: I have done.

SH: You have done. How did you find that, did you find it worked?

S6: I thought it was very good. There is always something I'm not happy with, it might have been a turn it might have been the start, or my stroke count or my pace. Something you know. Might have been something simple like, didn't streamline well enough off one of the turns which might give me a couple of tenths in the final. There has only ever been one race to date, in fact, where it has been perfect. Every single aspect of the race has been perfect. But even then, this was in Bonn 89, on the last turn my left hand slipped an inch or two down the wall and I probably lost a little bit of power.

SH: What was that Bonn 89?

S6: I won the European title for the first time and equalled Barrowman's record.

SH: Right.

S6: The only person who noticed that was (coaches name), and it was practically forgotten, you know but I did remember basically that happening.

SH: That was where you went a 61 hundred?

S6: 62.1

SH: Got a medal in the hundred as well?

S6: Yes bronze. So I think it's quite vital that even in a situation like that where you performed to the ultimate and won and set a new standard. When Linford Christie and Sally Gunnel are asked well what next, you've won everything. Well they say well I can always swim, run faster. I believe I can run faster and so from situations like that you realise the race wasn't perfect and perhaps then you can swim that little bit quicker next time.

SH: Which acts as the motivation?

S6: Exactly.

SH: Any other skills?
S6: Well let me think. Apart from just talking to myself and telling myself that I'm in good shape, the nerves are there so I know I can swim very well, I suppose the other things I do maybe are.

SH: Take your time?

S6: I try and focus on what I am trying to achieve in the race, not just doing a 61 or something like that but how far I want to go off the walls and holding technique...

SH: Yes.

S6: Maybe tunnel vision down the lane.

SH: OK.

S6: Although when I'm walking out to compete it might not be the tunnel vision focus for the lane, it might be the atmosphere.

SH: Right.

S6: Because it all depends what's the greater, what's the greater stimulus. At national championships there might not be a single person in the stand in the UK, whereas at Olympics there's like eleven thousand people screaming and shouting. In fact I was criticised in 92 for staring up at the stand, and was told I wasn't focused. Well it was reported I wasn't focused, starting into the stand and not focusing on my lane, which seemed to be the norm from a lot of the reporters that would see me swim domestically.

SH: But they didn't understand.

S6: They didn't understand what I was doing and I have subsequently spoken to people about it and they realise and you can draw a great deal of stimulus from that kind of environment.

SH: So you use imagery techniques,

S6: Yes, and goal setting is very important. I suppose it gives me a lot of confidence when I know I have done things correctly, and that helps keep me positive.

SH: Can you tell me a little bit about that?

S6: Every season I would write down a target time in my log book, I keep a log book every year, and have done since 84.

SH: Right.

S6: And since 92 I've kept a 'should', 'could' and 'just might' time. So the 'should' is obviously equal to my best, should do that. 'Could' is obviously to swim a little bit better than I have done before, but that 'just might' time might be something special where you do become the next Olympic champion I break a world record or so on. But usually and traditionally I have only had the one time, but it has always been better than my best. It would have
to be. But its not a 2.10, 2.12 or whatever, its individual 50s. So at the first 50 split, second 50 split, third and fourth.

SH: So you sub component it down.

S6: If someone was to say (subject 6 name), I think you can go 2.10, that's a fast time I really don't know if I could do that, but if you break it down into four individual one length swims, then it becomes more believable, and you think well I have actually split that time before and I've actually come back in that, my last fifty time has been that, so what I've got to find is really an improved split for the second length, and it just becomes more believable, and that's how I go about my goal setting.

SH: So you set time goals, do you ever set position goals as well. I mean at domestic level you are always expected to win, so do you set a goal to win?

S6: Firstly, I always set a time goal and process goals, particularly for turns, but then of course at the end of the day it doesn't matter what time you've done if you win.

SH: Right.

S6: And I have felt since the Olympics in 92, most races I've done, and were talking European Championships 93, Worlds, Short Course Championships 93, Commonwealths 94. I've always been in a race situation, I've raced for the medal.

SH: I understand.

S6: I don't know why this has swung around to be honest. It's a question I have been asking myself over the last few months, six months, I think its because I know my competitors so well. Probably there is an answer that I've been racing the same guys for ten years. But at the same time I try to stick to a race strategy, a plan that is going to give me that ultimate performance.

SH: I see.

S6: But I have become more aware of the race situation.

SH: Within this goal setting do you employ, you have mentioned stroke counts, hitting the walls correctly. These are process goals. Do you actually think quite carefully about the processes that are going to bring you about the time and therefore the position?

S6: Yes. That always takes place in mental rehearsal really. I don't actually make a note of that in my log book.

SH: That's part of the other mental preparation.

S6: But I do carry forward stroke counts from the past season. So I have always got something to refer to. It's no use saying, I went fourteen strokes, fifteen strokes in my case, so if I go fourteen strokes, I'll be better, if I go sixteen strokes I'll be better. It might be that fifteen suits me and sixteen and fourteen doesn't. So that's not necessarily something that you can improve upon, but it is something that you can equal or match, and feel and know that
is going to give you the ultimate split. If I stretch my stroke out too much I
might be a bit too slow and if I speed my stroke up then it might take too
much out of me, so for the sake of a tenth. So I am aware of those process.
The only thing I have always wanted to improve is my start to be honest. I
am aware that its not as good as it should be. If anything in my race is
negative, its always that in the back of my mind, thinking Im not going to be
ahead at the start. There's only three or four guys in the world, but, you
know, I can be level but I want to be in front.

SH: A ha.

S6: And I know Im not quite going to be there. I don't know if that's to do with
my technique or my body weight. Im only five eleven and eleven stone six,
where as if Im racing someone who is six three and thirteen stone, they have
got a lot more power off the blocks and they are further down the pool, angle
of pitch and body weight should take them through at greater speed, so that's
something I might have to accept, but nevertheless I don't want to accept it.

SH: It must be frustrating. Out of these mental skills, the imagery, the goal setting, do
you think any are more important than others to you personally? Which is the
most important mental skill you use to keep a positive interpretation?

S6: I think good goal setting, but they are not discreet, they all come together
really.

SH: And have you always been able to use these mental skills, have they come quite
naturally to you?

S6: They did come naturally, and I was very progressive, probably from 86. For
some reason, 86 was a big year for me, I got a bronze at Commonwealths and
it was a big turning point in my career. For some reason I had these
emotions come into mind, and things would hit me out of the blue, as I said I
might be driving the car, it has to be on my own obviously, whatever I am
doing is on my own. I couldn't do mental rehearsal if I was in a group.

SH: So have you ever been educated on these?

S6: No not really, but I have read a fair bit and then tried things out for myself.

SH: Very much self taught?

S6: Yes, yes.

SH: And you obviously practise these mental skills?

S6: I don't practise to make them better, or stronger, but I go through the ritual
if you like.

SH: So many times.

S6: Yes, in order to enhance the performance.

SH: OK, and do you feel that you are good at it? Do you feel that you are now good at
mental rehearsal?
S6: Yes.

SH: You do, just like a self perception kind of thing. Do they alter these mental skills depending on things like the standard of then competition your at?

S6: No.

SH: They don't. And what about the training cycle your in? I know you work on a seven week cycle.

S6: That's right.

SH: At different times of the cycle if you were racing, would you maybe rehearse things slightly different?

S6: Yes.

SH: In what way?

S6: I would never race now in weeks three or four of the cycle because I know I would just be too tired and heavy in the water.

SH: Right.

S6: And I think the result would be too negative. But if I was to race in week two or week six, obviously one and seven are the greater weeks.

SH: Yes.

S6: I would always go through the full routine of mental rehearsal, because nine times out of ten I will be racing in week seven or week one, so that meet will no doubt set me up.

SH: Its going to be planned isn't it. The overall plan.

S6: Exactly yes.

SH: And what about heat and finals. Do you prepare differently for heats than finals?

S6: No.

SH: No. Do you find it tiring mentally to psychologically prepare for a race and keep things positive?

S6: Yes, very.

SH: If you put a lot of energy into it?

S6: Yes, more so now Im older as well, probably because there is greater pressure.

SH: Do you ever experiment with different mental skills, or do you tend to stick with the ones that you've got and you know that work?
S6: I suppose if I was totally honest, they are the only ones I know, and I came about them quite naturally, and I've never attended any particular programme to expand them in any way. I know the team have had some relaxation classes and so on, but I wasn't really into that.

SH: This gets back to what we have said before in that these high intensity of symptoms you perceive in such a way that you felt there is no real need in lowering them.

S6: I agree, yes definitely.

SH: Which is what relaxation is attempting to do.

S6: I see.

SH: If you have really intense butterflies and you go about some physical or mental relaxation, it may reduce them, but if your perceiving yours as necessary for the race.

S6: Yes, it doesn't make any sense to reduce them.

SH: Do you ever mentally prepare for training as well as competition?

S6: Yes, in terms of certain weeks of the cycle I do, and I get psyched up and quite nervous. Motivated to perform because I know if it doesn't happen in the pool in training, it probably won't happen in the race situation.

SH: Specificity of .

S6: Exactly, when we were doing quality sets on number one stroke, two hundreds, broken two hundreds, then I need results and yes I would go through certain mental rehearsal patterns to get those results in training.

SH: OK excellent, we have just about finished.

ADVICE FOR OTHERS

SH: I want to use the kind of thing that yourself and the other elite swimmers are telling me to help other people in the future.

S6: Yes, absolutely.

SH: What kind of advice or suggestions would you give to a swimmer. The kind of advice off the top of your head to help them interpret their pre-race thoughts and feelings positively? What few words of wisdom would you give them?

S6: I think you have to have a methodical plan throughout your swimming which gives you piece of mind before the race, you know confidence so you see things positively.

SH: Right.
You can't just turn up at the leisure centre, jump in the water, and go bang, bang, bang up and down the pool, week in and week out and expect to swim well at the end of the season. So you have to have a methodical plan to include a structured training and competition programme and then when it comes to the championship itself they have to be very aware of the external pressures, which I think will be greater in years to come.

From sponsors, from press and media, and so on. But be in control of the internal pressures.

Yes, exactly. And I think if your in control of your internal pressures then you will be in control of the whole situation. And I think the one thing that has helped me has been this mental rehearsal, but also getting to know my competitors. Watching them when they don't know Im watching them, watching them warm up, watching them in different race situations and taking their strengths and weaknesses, whatever, it might be part of their character, that you don't like.

Your gaining one up on them which they don't know about.

Yes.

We spoke earlier that the high intensity of symptoms you have you perceive in a positive manner. If you were coaching and a member of your swim team perceived things very negatively, i.e. they got butterflies and adrenaline rush, but they felt this was a bad thing, what kind of advice would you give them.

Can you say the first bit again?

These symptoms you used to get before a race, you saw in a positive light, that they were necessary to swim well. If you were coaching and a member of your team saw this as a bad thing, they were negative, what advice would you give them?

I was coaching and one of my swimmers saw it was negative?

Yes.

No, I would just say that, this is what its about, this is the sort of pressure that you can expect but you have to make it positive. You have to turn the anxieties into positive.

Would you maybe draw on your own experiences?

O, I could always relate to certain occasions, Im just trying to think to put it in a sentence for you. Say like any other coach that you need to be nervous, but excited but without that your not going to get the adrenaline surge and you need adrenaline top perform to your optimum. And I suppose in a nutshell that about it.
S6: So just to be, I would always pre warn them to be very aware of their emotions that they will have, any possible anxieties that they'll have but always try and turn them into a positive, what's the word, not positive anxiety.

SH: State

S6: State, yes frame.

CONCLUSION

SH: Well that just about raps it up. Do you think I led your responses in any way?

S6: No, no not at all. It makes a change sometimes not having someone trying to tell you what you mean like the press tend to do.

SH: And do you think the interview went well?

S6: Yes, very good.

SH: Do you feel that, if we take this as a story from the time when you got involved to now. Do you think that you have told your story quite fully, obviously in the time limits allowed?

S6: Totally yes.

SH: Is there anything important that you feel we haven't covered?

S6: Not that I can think of (Interviewers name).

SH: Great thanks very much.

S6: Thank you.
APPENDIX 16b

Interview Transcript Example - Study 3 - Subject 8

PHASE 1

EARLY EXPERIENCES

SH: To understand your development and commitment as an elite swimmer we have developed this involvement progression questionnaire which charts your progress from the time you started swimming up to now when you are one of the best swimmers in the world. So to put things in the appropriate perspective we will start with the process that you went through in initially getting involved in swimming. So referring to phase one of the questionnaire, how old were you when you first began swimming?

S8: I started off when my mother took me just to learn to swim when I was two.

SH: So it was your parents who got you involved. Have you got any brothers or sisters who swam?

S8: No, I haven't.

SH: And did you join a formal teaching group?

S8: My parents took me from two until five. I couldn't join a formal obviously group lessons until I was five, and took the group lessons at five at the local club. And it was at a school gala, swam a school gala, and the local coach was there from the local club, obviously liked the look of what he saw and asked me to go along when I was seven and things went from there.

SH: Things went from there, so roughly, between the ages of two and six, how often did you swim?

S8: Only once a week.

SH: Just once a week, and that was at night was it?

S8: That's right yes.

SH: Did you enjoy swimming when you first started?

S8: I found it a bit of a chore. I mean it was a bit different but like all young boys I liked football and that sort of thing, to be out in the open, but I realised you have to learn to swim and your parents drill it into you, so I went along and just grin and bear it.

SH: And did you do anything else apart from swimming at this time?

S8: Yes, I mean I was the, I suppose you know a lot of elite sports people are sporty and I was good at football and running, and whatever else you do at school. So I was always very sports and sport oriented. So as I say I just went along to swimming to learn to swim.
SH: Right, and did you do any of the other sports competitively?

S8: Um, only on a school level, I never played for a football team out of school, it was all for the school.

SH: OK great.

PHASE 2

INCREASED COMMITMENT TO SWIMMING

SH: Phase two is actually characterised by swimming taking up a little bit more of your time when you became more committed to the sport

S8: Mm.

SH: When you started to become a little bit more serious and actually started competitions. So if we refer to phase two of the questionnaire please try and stay focused in this time period and remember take as long as you want in answering, there's no hurry.

S8: Yes.

SH: So how old were you when you first began competing in like club galas, club championships?

S8: I was only seven when I first started.

SH: Seven.

S8: My first gala was when I was seven, yes.

SH: And what competition, what gala was that?

S8: It was just a small local club gala.

SH: And between the ages of seven and eleven how often did you compete?

S8: O, very rarely, once a month at the most.

SH: Just once a month, not that often. Did you ever swim up an age group, so you were swimming against kids who were older than yourself?

S8: Yes, I mean Im sure a lot of swimmers have to do this, clubs, obviously Im in an ideal situation now when we have got enough swimmers, but yes, I was swimming against swimmers a year, two years older than myself.

SH: And how did you feel about that did you used to think, "O well I wont win because they are older than me"?

S8: Yes, I did yes, I just went along. If I won brilliant, if I got beat well they were up on me so never mind. As long as I beat everyone in my age I was reasonably happy.
SH: OK, great, and how many times a week were you training approximately during this time?

S8: It wasn't very much, only two or three times a week at the very most.

SH: Two or three times a week, and how long were the sessions?

S8: No more than an hour.

SH: Did you ever do any kind of land training at all?

S8: No I didn't, nothing at all.

SH: And what club were you a member of during this time?

S8: Hayden Hill.

SH: Hayden Hill.

S8: Which is only a small private club.

SH: Right, and did you change clubs at this time?

S8: No, I didn't, I stayed with the club until I was fifteen and then I moved to City of Birmingham.

SH: Were you the best swimmer for you age in the club?

S8: No, I wasn't, up until I was nine and even ten years old I was just a member of the relay team, I never really got a chance to swim in the individual unless it was the B team. So if I did swim for the A team it was only in the relay.

SH: And the other things you spoke about in the first phase, the other sports you used to do. Did these continue, did you continue with school sports?

S8: Yes I did, I continued with football for the team, basketball, whatever or was, I always kept up with the school sports.

PHASE 2

EARLY COMPETITIVE FEELINGS

SH: Now we have talked a little bit about how you got into swimming and got into early competitions, I want to focus a little bit more on the things you may have thought or felt when you actually first began competing. I know its quite a long time ago, and if you cant remember just say so, but please don't guess, and again lets stay focused in phase two.

S8: No problem.

SH: But did you enjoy competing when you first started, did you like racing?
S8: Yes I did, I mean that's why I did it, I mean Im sure its the same for a lot of
youngsters, I didn't enjoy training, nobody does but I did it for the
competition. I enjoyed racing, I enjoyed pitting myself against somebody
else, and that why I did it.

SH: OK, great. Can you remember back that far, and can you tell me a little bit about
the kind of thoughts and feelings you experienced before a race?

S8: I used to worry a bit and be a bit apprehensive

SH: Why was that?

S8: Yes, obviously for a young ten or eleven year old, its something your not used
to. I mean you compete for your school and that sort of thing but in
swimming your on your own, obviously I competed in relay galas, but
obviously there was individuals. But yes, a bit worried of doing badly,
not to the point of being nervous wreck, but obviously the butterflies in the
stomach and that sort of thing.

SH: So there was some definite physical symptoms?

S8: There was yes.

SH: Butterflies. Any others you can remember?

S8: No.

SH: That was the main one.

S8: Yes, it was.

SH: And what kind of things did you used to think, what kind of things went through
your head before you competed?

S8: To be honest with you I was, you swim in the junior league up until your
eleven, and I was worried about letting the team down. Hayden Hill were a
very good diddy team.

SH: Right.

S8: 82, 83, and 84 won the national final and I was always worried about letting
the team down, I obviously wanted to do well and win my race but that was
to get good points for the team. I think that's where the worry came
from letting the team down and that was quite negative really.

SH: Right. And I know its quite a long time ago (Subject 8), and its quite difficult to
remember. But if you look back on it now, did you interpret these feelings you
had before a race as a good or a bad thing as to how you were going to compete?

S8: Well I remember my first reasonably big meet, it was a Junior league final,
Midland District final, it was at Nuneaton. I was driving there with my dad
and um, said I was reasonably nervous, said I had butterflies in my stomach.
He said that's a really good thing because that will get the adrenaline flowing.
Obviously when your young you haven't got any idea what adrenaline is,
and he said it was a good thing so I took it as read that it was a good thing.
SH: Right and what about the worrying about doing badly?

S8: Dad used to tell me again that that was natural as well as how I used to feel inside, so I grew to take them as a good thing. They weren't good to start with but were after a bit.

SH: OK?

S8: And I think that eased my apprehension a bit, that OK, I was feeling this thing in my stomach or whatever it was, but it was a good thing and so I took his word for it.

SH: OK, did you feel under any kind of pressure when you first started competing?

S8: Um, not really, there's a little bit of pressure I mean my parents didn't pressurise me in any way. They wanted me to do well and encouraged me but they didn't pressurise me. Any pressure would come from myself or from fellow team-mates. You know, (subject 8 name) you need to win that race, you need to get maximum points, you need to do well. But there was no pressure from parents, all the pressure was from myself and or from other swimmers.

SH: And did you do anything to try and cope with this kind of pressure?

S8: No, I just accepted it and just carried on as if I would anyway. Just mix with other swimmers, sat on the side of the pool and waited for my swim.

SH: OK, did you, if at all during this phase between the ages of seven and eleven would you say that you were ever anxious before a race. Would you have labelled the way you felt as anxiety?

S8: No, I wouldn't no. It wasn't really negative.

SH: You wouldn't, not really.

S8: No, I don't think I was ever negative at that age. Im mean I was quite philosophical, I mean I wanted to do well for myself and the team but at the end of the day if I got beat I got beat, if I won, great. I mean there was no anxiety, I wouldn't be depressed if I got beat, I mean at that age it was still a bit of fun, you know.

SH: Right.

S8: It was just something I did when I got back from school.

SH: Can you remember any particular races that particularly affected you, when your thoughts and feelings were very intense?

S8: Not really, let me think for a bit

SH: OK.

S8: I can't really, is it really important for me to pick a race out.
SH: No, no problem, we have covered the main points, I was just wondering.

PHASE 3

FULLY COMMITTED TO SWIMMING

SH: We will move onto this phase which should be a lot easier to remember because it's quite recent. This focuses on the period from age eleven where swimming really started to mean something, and you know became the main focus of your life in terms of sport. We will discuss again your thoughts and feelings prior to racing. Remember to refer to your questionnaire and take as much time as you want. Just some basic questions before we actually get in to it, um, to do with your training. How much training were you doing on average were you doing when you started to become more and more committed?

S8: It was about eleven of twelve, as I say my first age groups was in 85 and that was only in a relay. But um, I realised my first age groups individually would have been 86 in Leeds and that year I would have been doing a reasonable amount. I was swimming five nights a week.

SH: Right.

S8: And I was swimming on Sunday afternoons as well, so your looking at six sessions a week, I didn't do any land work with that, but, six days out of seven, which is quite a lot for a twelve year old. But the sessions weren't intensive in any way. It was only a small private club, so the sessions were no more than an hour or an hour and a quarter, so it wasn't a massive amount.

SH: So as you moved up the standards, so Junior Europeans, did you go to that?

S8: No. It was just a schools international.

SH: Schools international.

S8: Home international.

SH: And how much training were you actually doing as you moved up the ranks?

S8: I had the same coach for three or four years. So what we tried to do was up the training each year, I mean that's the way we looked at it, was progression. So up until thirteen, I did my first individual age groups when I was twelve at Leeds in 86. The year after we started doing one or two mornings a week, but that coincided with moving up a group within the club into the top group when I was thirteen. And then by the time I was fifteen I was doing five nights a week and Sunday, and then three or even four mornings a week. It was a big step up over the two years, but the mornings were only three quarters of an hour and it was only half past six in the morning.

SH: Right.

S8: So the mornings were very low key just to get a few extra yards in.
SH: Every week?
S8: Yes.
SH: And did you swim through your exams, your 'O' levels?
S8: Yes, I did yes.
SH: You did.
S8: I found my GCSEs hard. I had been picked for the youth team that year, and as you imagine the team has three or four meets over a period of three months. And it did coincide with, not with actually my exams but with the period leading up to my exams where there is course work and that sort of thing. And I did swim through it, because at fifteen or sixteen I was an international and I could see that my swimming was going places, but I did swim through it, but my exams went reasonably well.
SH: Right, and did you have any other activities apart from swimming, did you do anything else?
S8: Yes, I still competed for the school, I played basketball for the school, played football for the school. Obviously it was erm, it took a bit of a back burner because the swimming was going very well.
SH: Yes.
S8: But you know, I didn't just sit in the house all night. I went out with my friends, went out with girls obviously at that age and that sort of thing. So there were other things apart from the swimming.
SH: Right.

PHASE 3
JUNIOR

SH: Now we have spent a little time on how you got involved in swimming, we can start to move on to some of the main areas of the interview when your commitment increased. If we look at your questionnaire I see that you competed right up to international standard as a junior so we will focus on this period between twelve and fifteen years OK.
S8: Yes.
SH: Do you think there was any differences in the way you felt and the things that you thought before a race, as opposed to before. You said you got nervous physically and worried about doing poorly and about letting the team down between the ages of seven and eleven. When you moved up to the ages of fifteen you were competing obviously as an international junior. Did you feel differently before your races?
S8: I think the worry was still there to a degree but what I did find was that, just after my fifteenth birthday I moved to City of Birmingham with a coach called (coaches name) who I learnt an awful lot from. He did instil a lot of confidence in me, so going into a race there was obviously a bit of worry but there was also a confidence in my own ability that I was as good as if not a lot better than a lot of the swimmers in my, in the same race as me.

SH: Right.

S8: Especially at the junior level as your racing against guys who are the same age as me and your not swimming against someone whose ten years older than you and a lot stronger, but especially at the junior level I went into the race knowing that nine times out of ten I was better than everyone else in the race.

SH: Right.

S8: So although I worried a bit which was a little detrimental and negative obviously but there was a lot of confidence as well.

SH: A lot of confidence. Did you still have the physical symptoms before the race, the butterflies.

S8: Yes, just the natural symptoms before a race but by now I realised what they were and just expected them to be there.

SH: Right. And were there any other different things that actually went through your mind before you r race as you started racing at higher and higher standards?

S8: Yes, I mean obviously I learnt a lot from my coach. The sort of race preparation and going through my race, bit by bit. Obviously seeing a good start, a good turns, race visualisation, that sort of thing. We also did some work with mood words, fast turns and that sort of thing. We did quite a lot of work, and obviously for a sixteen year old that's quite a lot to take in, but, um, I think we went about it the right way and obviously things went very well.

SH: That's interesting. At what level do you think your feelings were the most intense. Was it when you were abroad or was it at home nationally when you were a junior?

S8: I think at international level. The most nervous I have ever been was the European juniors in 1991. It was a European final and I was rated second going into the final, and I remember feeling physically sick.

SH: Right.

S8: I have never known that before and I've never known it since.

SH: Did you try and do anything about that?

S8: I did try and calm myself down. I went and sat on my own and just tried to think about football or cricket or anything but swimming to be honest with you, but um, I had to walk out in front of a couple of thousand people and try
and race a European final. I knew the feelings were natural in this type of situation, but this time they were a bit more intense.

SH: Right.

S8: Which for a sixteen year old is obviously very daunting. But I swam well so obviously what I did do went very well. I must of somehow made them work for me in the race.

SH: You were able to cope with it.

S8: Yes.

SH: So you still experienced these certain thoughts going through your head. there was a high degree of confidence and the was the physical symptoms there. Did you still interpret these in a positive way, did you still see them as being a good thing for the race?

S8: Yes, I did, um, I said that I was very nervous but it was under control I mean I've seen a lot of people who have gone to pieces with nerves. But I don't think that ever happened to me I never went to a big meet when I wasn't nervous, and swam unbelievably badly. I've been reasonably lucky, I've never really had that many disappointments, I have always swam reasonably well.

SH: Right.

S8: And I think I took it as a positive thing.

SH: Both physical and mental symptoms?

S8: Oh yes, the physical meant that I was ready, and I said in the last bit, my dad told me these would being out the best in me at the gala. So, how would I put this. Yes, the worry of letting my teammates down for example, and that kind of thing, that was also positive. I realised I wanted to experience a bit of nervousness or something like that. Mind you it wasn't anxiety as it wasn't negative, no so I wouldn't have said it was anxiety.

SH: I understand, so you didn't do anything about the symptoms?

S8: So I didn't do anything about them, I just grew to accept them, and accept that I had to feel that way and discovered they really could make me swim better.

SH: Right so you learnt for yourself.

S8: I think I was reasonably lucky I was, I think I had an old head on young shoulders at the time, um, I ad the benefit of being at a big club and training with the likes of (elite swimmer's name) and (elite swimmer's name) and those sort of people and obviously learnt a lot from them from a young age.

SH: So which was the most positive towards your racing, the physical or the mental?
S8: Erm, difficult to say really, I'm not sure, I suppose I needed both types of symptoms, it wouldn't have been the same if some were missing, so I'd say they were equally important.

PHASE 3

SENIOR

SH: If we move on to your time as a senior, you competed right up to Olympic standard, World Teams, very major championships. As you moved into the senior ranks and these very high pressure situations. Did you feel differently before your races than when you were a junior?

S8: Yes I did.

SH: You did.

S8: Especially when I made the transition from junior to senior, I mean it is a hard transition and a lot of people fall by the wayside. It was sixteen, seventeen, just when I came out the junior ranks trying to make the senior team. Luckily I came out the juniors in August 91 and my first international was December 91, which was obviously not a short period of time but reasonably close. I remember there was a big change, I mean I swam the European junior in August 1991 and obviously I was swimming against people my age, and I was very confident in my ability and I swam well and got a silver medal at Europeans which is very good. But then December only three months later I was thrust into a world cup meet.

SH: Right.

S8: And my first ever race was.

SH: This is for the GB team?

S8: Senior England team, I was thrust into a meet in Canada and my first heat of the 50 backstroke, my first ever race as a senior I was against the world record holder, (swimmer's name) Obviously when you swim against a world record holder and you're seventeen years old it's a bit daunting.

SH: Absolutely.

S8: That's the only time up until then when I hadn't had any confidence, obviously when you're twelve you don't know what's going on, but for a number of years that was the first time I hadn't had any confidence in my ability. I knew I was good for my age but there was no way, not a chance in hell I was ever going to beat this guy next to me.

SH: Right.

S8: And so, um, things didn't go very well in my first meet, but erm, I think that was due to, as I say, I just didn't have, I still find it now even, I still don't like
swimming a race where I haven't got a chance of winning, but I still try like hell I just don't like it thats all.

SH: Right.

S8: I mean we saw it tonight, in the hundred backstroke. I don't like swimming in a race where I know I have not got a chance of winning. To be honest with you I don't see the point in doing it. Maybe that's just the way I am.

SH: I understand that, I mean I do it all the time. At these very high standard competition then, I understand like the external pressures. So are the kind of things that are going through your head like comparing ability level.

S8: Yes, I would say that, but it doesn't effect me negatively, no, no, not at all.

SH: What about physically, do you feel physically different at these high standard competitions, than you did before as a junior, or are the physical symptoms exactly the same?

S8: The physical symptoms were very similar, obviously I've said it before, a reasonable amount of nerves, obviously when you see a world record holder by the side of you in the next lane you obviously a lot more apprehensive.

SH: Right.

S8: But I think the symptoms were very similar.

SH: But you still perceived these in a positive light.

S8: Yes, I think I worked them to my advantage, you know.

SH: As a junior you said that you didn't really feel anxiety.

S8: No

SH: As a senior, would you ever say that you were anxious before a race, would you use that term?

S8: I wouldn't say I was anxious, no. Apprehensive maybe, a little worried but not anxiety, no anxiety is the wrong word.

SH: Right, but for instance if we had a list of labels and there was excited, apprehensive, anxious. Anxious wouldn't be.

S8: Anxious wouldn't be in it, no. I wouldn't ever say I'm anxious before a race, people say "I'm scared to death of swimming". I wouldn't ever, ever say I've been scared of swimming a race.

SH: Right.

S8: I mean at the Olympics, I mean there are twelve thousand people watching and millions watching on the box, but I wouldn't say I was ever scared of swimming, obviously I was apprehensive, you want to swim well for yourself, but, um anxiety, no.
SH: Asking the same question as I did when we were talking back to when you were a junior then, which symptoms were the most positive, the physical or mental now you were in senior swimming?

S8: To be honest, I have to be a bit worried, I think everyone does to a degree, and I have to have the physical symptoms. What I mean is I just use both types of symptoms to my advantage, yes they are a good thing.

SH: OK, great.

PHASE 3
MENTAL SKILLS

SH: I'd like to talk now about the mental skills and strategies that you use now to help maintain a positive interpretation of your thoughts and feelings before a race? We may have mentioned some of these before, but don't worry about that, just take your time in answering the questions.

S8: OK

SH: So can you tell me a bit about the kind of skills you use to maintain a positive interpretation?

S8: I've learnt from experience you need a definite routine. I mean people have commented on how much flexibility I do, but I use that to get myself in a frame of mind to swim, it's part of my own routine.

SH: Right, can you tell me a bit about that?

S8: What I do, after the warm up I just sit quietly at first. I mean I usually sit on my own and think about the swim. But I don't think that works to my advantage now. I mean this has changed over the last couple of years, I um, sit and talk to the lads and sit and talk to (coaches name), my coach and then I still go down reasonably early for my swim then I shall sit on my own, even as much as twenty minutes before I swim. sit on my own, watch the swimming, do a bit of flexibility while I'm watching the swimming, do a set flexibility routine, you know, I'm sure you have done it yourself.

SH: Yes.

S8: And I shall use that to get myself in the right frame of mind. I shall go through my swim while watching the other swimmers. Maybe I'm not taking quite as much interest in the swimming but I shall watch the swimming and use that to my advantage, I mean if there a good swim.

SH: So you will draw on the atmosphere of the other races?

S8: Yes, I shall, yes, especially at a big meet, Commonwealths or Olympics. I mean especially if there is a good swimmer from your team, that swim very well, obviously you can draw on that.
SH: Right.

S8: And just go through, visualise, I don't visualise it too much, people say they go through their race time and time again, but I don't do that. I just think, "I want to get a good start," "I want to have four or five good turns or whatever it is, and a good finish" but I wouldn't say that I go through it time and time again. I know (swimmers name) sits down and before he swims has gone through his swim hundreds of times before in the months preceding, but I don't do that. I just sit and watch the swimming, do a bit of flexibility.

SH: So if we just go off on a tangent about the visualisation for a second.

S8: Yes.

SH: You are obviously familiar with mental imagery?

S8: Yes.

SH: Do you use mental imagery so to speak?

S8: Only a very small amount, but it is important.

SH: A small amount. And when you use that do you actually imagine yourself swimming through the water, or is it like watching yourself on TV?

S8: I do it as watching myself, say it was like a television camera or someone on the balcony watching me swim.

SH: OK, and do you ever get any physical feelings when you actually doing that. Say your driving a car or walking along and imagining yourself in a race.

S8: Mm.

SH: Would you ever get a slight buzz from that?

S8: O yes, obviously there's a tingle down your back and that sort of thing. I do it, I find it quite a lot when I'm driving to training, because obviously I drive through the centre of town so the traffic is a nightmare. But you have got a lot of time to yourself and maybe there's some decent music on the radio which gets you in the mood. Yes, that sort of thing, I think that applies to me.

SH: Right, OK. How do remain focused on your race. So for instance, say we have got an uncontrollable distraction, your in a high pressure heat to make the final, say Worlds or something like that and in the heat in front the pad breaks. OK there's a ten minute delay. What kind of things would you think to keep your focus on the race, how would you deal with that, I mean has it ever happened?

S8: Yes it has, it happens, I wont say at every meet but it happens regularly. I would just go back ten minutes in my routine.

SH: Right.
S8: I may have built up to a crescendo, obviously, so your about to jump in the pool and you've got to wait ten minutes. I would go back ten minutes into my routine.

SH: So you would start.

S8: Yes, I would start again. Obviously you can't always do that because you don't know how long it's going to take to fix the pads, it could take ten minutes, it could take one minute.

SH: Right.

S8: So I should just do some stretching, look at the crowd, look at the scoreboard and just keep cool and positive.

SH: Yes.

S8: Just focus on the air.

SH: Focusing on the environment?

S8: Yes. I mean whenever I walk on to the poolside, walk on to the block I always look at the scoreboard, at my name. I mean I don't know if that got anything to do with anything but I just make sure my names up there, make sure my names in the right lane.

SH: Yes.

S8: I know its silly but I always do it, its part of the routine that I know works for me so I'm not going to change an little part of it at the moment.

SH: Its just checking though.

S8: Especially at a major meet I walk on and take a good look at the crowd. I mean I know a lot of people don't like to look at the crowd, but I like to look at the crowd and look out someone I know if that possible and just draw on that energy, because obviously there is a lot of energy there to be used to your advantage and just draw on that.

SH: Right.

S8: I mean the way I look at is you might be suffering because you have to wait ten minutes and its a bit of a hassle but the other seven swimmers in the race, they have got to put up with the same thing, so it isn't just you that being put out, its the other seven swimmers as well.

SH: It affects everybody equally.

S8: So, yes. I just try and keep myself calm as I know the others are going through exactly what I'm going through.

SH: Right, anything else?

S8: I congratulate myself while I'm in the race.
SH: OK.

S8: I mean tonight I had a good start so I say "Good start (name), come on get your arse in gear and lets go" you know and if its a good turn "O good turn there" you might have caught the guy up next to you. You may have pulled a bit away, it was a good turn but he's going away you better catch him up a bit. Just small things during the race. But afterwards you will go over it in your own mind, what you've done, what you could have done better, what was good what wasn't, where the race was strong where it wasn't. Then I go over it with my coach, Tim as he's obviously got a different perspective. He wants my thoughts and I want his, and we will go over it that way as well.

SH: OK, what other strategies do you use?

S8: A big one is goal setting. I mean we use it a lot. I sit down with (coaches name) at the start of the year and this I do an awful lot with my coach. Obviously I've got my own personal ambitions.

SH: Yes.

S8: But I sit down at the start of the year with (coaches name) and we go over exactly what we want.

SH: Right, what kind of goals do you set?

S8: Um, the first thing we do is set out the entire year. Training volumes, training intensities, when we have done that we work that in conjunction with the meets that we know and the dates of those obviously. And then we sit down and discuss what we want from the year. What sort of times we want from each meet leading up to obviously the trials in April taking this year, and then the Europeans at the end of the year with August.

SH: So it works on like a yearly programme?

S8: Yes, I sat down after the world championships in September and discussed the whole year with (coaches name) and what we wanted.

SH: And is it mainly kind of time goals that you set or is it or do you set position goals as well?

S8: No, I set time goals because the way I look at it is erm, you can set a position goal, say I want to win a goal medal at Europeans, but you don't know what time its going to take to win that gold medal.

SH: Its a bit out of your control.

S8: I mean you could go in and have no idea what anyone else is going to do. The only thing I control is how I swim.

SH: Right.

S8: So we set a time goal. Hopefully, this may be a bit if a bad, a bad way to look at it in that if the time isn't good enough you get beat. But I always realistic and I don't want to set something that's too hard obviously. We sit down and say, all right then, this last year, I think we could do this, this and this to
improve and think we could do this time. Weather that is good enough to win or not is a different matter.

SH: Its a learning game isn't it?

S8: Yes, we will find out when we get to it.

SH: Do you set any kind of process goals, by that I mean for instance your race would be that you want to swim a 54.5, and the way to get to that is to hit three efficient streamlined powerful turns, so you set like processes within the race?

S8: No, I don't do that consciously, but I do focus positively on that kind of thing before a big race when you know everything has to be just right.

SH: So you don't break it down to that extent?

S8: No, not to that extent. We say you know, we want to swim 54.5 but to do that you have to turn in 26.5. We break the race down but don't actually break it down into, you need a good turn there, a good turn there and that sort of thing. We do break it down but not to that extent.

SH: Out of these mental skills, the imagery that you use, the goal setting. Anything else?

S8: If I'm a bit stressed out, I'm lucky in that (coaches name) very perceptive and he knows how I'm feeling before I do really to be honest with you. If he sees that I'm a bit stressed out or a bit anxious or whatever the word may be he will say I think you feel this way, why don't you have tomorrow morning off, why don't you go away for a few days, that sort of thing. So it is a lot of give and take between myself and the coach, which I am very thankful for. I think it works, its a bit of a two way process, and I think it works very well.

SH: Out of these mental skills, the imagery, the goal setting, and like your pre-race plan. Which do you think is the most important to maintain this facilitative and positive interpretation to how you feel before the race?

S8: I wouldn't say that one is most important, I think that however many there is they all fit together in the jigsaw so that things are positive and that will bring you the performance.

SH: Its an overall mental plan.

S8: Yes, whether you use one more than the other, I think each part is just as important as the other one. You may only use, say a small part of goal setting, but, erm just that small part, that small part might be the difference between you winning Olympic silver and Olympic gold.

SH: Right.

S8: So I think they all fit together to the jigsaw.

SH: OK, great, have you always been able to use, if we refer to this package as mental skills.
S8: Yes. I have always been able to use them, once I knew about them, you know being told. Hold on, yes, I suppose it's important to say that I have trained myself to do them and yes, I've practised them a lot.

SH: Have you always been able to use these?

S8: Erm, to a different extent, yes, I mean obviously Barry Prime taught me a lot when I was a junior fifteen and sixteen. I used them then but not to the extent I do now, obviously I've learnt, being in the Olympic team and Commonwealth Games champion and that sort of thing you learn a lot over a period of time and you learn a lot when you come into contact with different people, psychologists, nutritionists and it's just a learning process as you go through your career. Just trying to fit each one together that may bring you that extra tenth of a second, that extra little bit.

SH: Right so would I be right in saying that the way these mental skills for you have developed is via learning from others?

S8: Yes, it's been a learning process. I mean I haven't gone to a book and read it, I've just listened to what other people have got to say.

SH: Tried it for yourself.

S8: Yes, tried it out if it worked great, if it didn't I discarded it. There's a lot of things we heard from the psychologist on the Olympic team that I did agree with but there was also a lot of things I didn't agree with and so, I just took the positive things that worked for me.

SH: Right.

S8: The one thing that did work was I mentioned mood words before. I just use one word that will help me on my turn that will help me.

SH: So you use like a cue key word.

S8: When I go into a turn I say "snap" to myself, in my head, that quick words that will get me over quicker on the turn. Just one word and that was the one thing that I drew positively from the Olympic psychologist. Now I know a lot of people didn't think he was good and maybe wasn't the best man for his job but that one part I did find very useful.

SH: OK good and you obviously practise these mental skills at meets very regularly?

S8: Yes, before every race, all the time, you need to to keep them sharp.

SH: Do you think that you are quite good at them now, do you think that your quite successful?

S8: Yes I think. I wouldn't judge them individually. I just look at the overall performance. And I think everything is going well, obviously Commonwealth champion and World Championship finalist. The overall performance is going very well.

SH: There's nothing to suggest that they are not working?
S8: That something's going wrong, no. Just going off at a tangent, people say that I'm a bit overweight and I'm carrying a bit of fat, but there's nothing to say that if I lost that.

SH: You'd go any quicker.

S8: That I'd go any quicker. The way I look at it is that things are going great as they are so why change a winning formula. So I just keep everything as it is.

SH: Do you still mentally prepare for like low key competitions, would you mentally prepare for like a lower standard meet?

S8: Um, yes, but not to the same extent, obviously for an Olympic final the level of preparation is going to be a lot higher than say a Midland district final. Yes, but everything in moderation.

SH: And what about, do the mental skills alter depending on your training cycle. I mean I know quite a lot about your training cycle, that you won't race in the hard weeks, weeks three and four. Do you ever race in the hard weeks?

S8: It all depends on where meets lie. We always try and race at the end of week seven, because we swim a seven week cycle. We always want to race the end of week seven. But if say a grand prix we want to swim in falls in week three or four, excuse me, we will swim but we won't put so much emphasis on it obviously. We have been working hard and don't expect too much. But we want to swim reasonably fast at the end of week seven.

SH: Would you mentally prepare for races that weren't backstroke? Would you go through a routine for like your B or C events?

S8: Yes I would but again not to the same degree that I would for a 200 backstroke final.

SH: Right.

S8: Obviously if I was swimming a hundred free or a hundred fly whatever it may be.

SH: Or a 4x100 relay.

S8: Yes, Loughborough beat us but never mind. But yes I would it all depends on the level of the meat and the level of the competition. I mean obviously, you mentioned the 4x100 relay in the national final I want to get quite worked up for that because it's reasonably important and I want to swim well. But if it was the 50 fly in the county final there's not going to be the same level of preparation.

SH: Do you find it tiring to mentally prepare for a race?

S8: Yes, I do.

SH: You do.

S8: Yes I do. I often go back in the day a flake out for a few hours if that's possible and then. I'm feeling it now actually.
Yes after three days.

After three days of hard competition and its hard on your body, but obviously you can cope with that, but its hard on your mind especially when you need to swim fast heats as well as fast finals. Its tough mentally.

And do you ever experiment with like different mental skills or do you tend to stick with the ones that you've got?

As I said I don't like to change a winning formula. All the little mental things I do, both long term and short term all fit together and I feel Im always positive about how I feel before even the really big races. I keep things as they are. I have found a reasonably good routine that works, I mean its proven and erm, I don't want to change a winning thing.

Right, and do you ever mentally prepare for training as well as competition?

No.

You don't.

No, I mean I just go to the session knowing what I want to get out of it, because we know reasonably in advance what we are doing, especially if its a big set or a lactate set. I just know what I want out of it but I wont do any sort of mental preparation for it.

Now, we have just about finished, if you were coaching and one of your team members was interpreting the way they felt physically and mental before the race as negative, what would you do?

I think I would try something simple like my dad did with me and just explain why they feel that way and that its a good thing, so to try and accept it, get on with it, enjoy it and try and make it work for you.

Right, so you would draw on your own experiences

Yes even if I wasn't in myself and go one step higher and say look (elite swimmer's name), Olympic silver medalist was like this at your age and like this now and try and put their mind at rest a bit.

OK, excellent. OK that just about raps up the interview but I've got to ask these few questions. How do you think the interview went?

Think it went fine, yes, I enjoyed it.

OK great, do you feel that if we take this progression s a story, do you think that you could tell me your story quite fully.
S8: Sure yes, I can't think of anything else.

SH: And do you think I put words into your mouth or led your responses in any way?

S8: No, not at all, you allowed me to say what I wanted.

SH: OK great, is there anything you think we've failed to discuss.

S8: No I don't think so.

SH: Great excellent, thanks a lot (Subject 8).
APPENDIX 17

Sport Imagery Questionnaire
(Vealey & Walter, 1993, Adapted from Martens, 1982)

Directions
As you complete this questionnaire, remember that imagery is more than just seeing or visualising something in your mind's eye. Vivid images may include not only visualising but experiencing many senses such as hearing, feeling, touching and smelling. Along with these sensations, you may also experience emotions or moods.

Below you will read descriptions of four general sport situations. You are to imagine the general situation and provide as much detail as possible from your imagination as possible to make the image just as "real" as you can. Then you will be asked to rate your imagery on six dimensions:

1. How vividly you saw or visualized the image.
2. How clearly you heard the sounds.
3. How vividly you felt your body movements (kinesthetic sense) during the activity.
4. How clearly you were aware of your state of mind or mood or felt the emotions of the situation.
5. How well you could control the image.
6. Whether you could see the image from inside your body.

After you read each general description, think of a specific example of it - e.g., the skill, the people involved, the place, the time. Next close your eyes and take a few deep breaths to become as relaxed as you can. Put aside all other thoughts for a moment. Keep your eyes closed for about one minute as you try to imagine the situation as vividly as you can.

There are, of course, no right or wrong images. Use your imagery skills to develop as vivid and clear an image of the general situation described as possible. After you have completed imagining the situation described, please rate your imagery skills using the scales provided.

For items a-d:
1 = no image present
2 = not clear or vivid, but a recognisable image
3 = moderately clear and vivid image
4 = clear and vivid image
5 = extremely clear and vivid image

For item e:
1 = no control at all of image
2 = very hard to control
3 = moderate control of image
4 = better-than-average control of image
5 = complete control of image
**Practising Alone**

Select one specific skill such as a racing start, tumble turn or a specific stroke. Now imagine yourself performing the skill at the pool where you normally train without anyone else present. Close your eyes for about one minute and try to see yourself at the pool, hear the sounds, feel your body perform the movement, and be aware of your state of mind or mood.

a. Rate how well you saw yourself doing the activity 1 2 3 4 5  
b. Rate how well you heard the sounds of the activity 1 2 3 4 5  
c. Rate how well you felt yourself making the movements 1 2 3 4 5  
d. Rate how well you were aware of your mood 1 2 3 4 5  
e. Rate how well you controlled the image 1 2 3 4 5  
f. Could you see the image from inside your body? yes no

**Practising with Others**

You are doing the same activity but now you are practising the skill with the coach and your teammates present. This time, however, you make a mistake that everyone notices. Close your eyes for about one minute to imagine making the error and the situation immediately afterwards as vividly as you can.

a. Rate how well you saw yourself in this situation 1 2 3 4 5  
b. Rate how well you heard the sounds in this situation 1 2 3 4 5  
c. Rate how well you felt yourself making the movements 1 2 3 4 5  
d. Rate how well you felt the emotions of this situation 1 2 3 4 5  
e. Rate how well you controlled the image 1 2 3 4 5  
f. Could you see the image from inside your body? yes no
**Watching a Teammate**

Think of a teammate or acquaintance performing a specific skill unsuccessfully in a race such as missing the wall on a turn. Close your eyes for about one minute to imagine as vividly and realistically as possible watching your teammate performing this skill unsuccessfully in a critical part of the race.

a. Rate how well you saw your teammate in this situation
   
   Rate: 1 2 3 4 5

b. Rate how well you heard the sounds in this situation
   
   Rate: 1 2 3 4 5

c. Rate how well you felt your own physical presence or movement in this situation
   
   Rate: 1 2 3 4 5

d. Rate how well you felt the emotions of this situation
   
   Rate: 1 2 3 4 5

e. Rate how well you controlled the image
   
   Rate: 1 2 3 4 5

f. Could you see the image from inside your body?
   
   Answer: yes no

---

**Racing in a Contest**

Imagine yourself performing the same or a similar activity in a race, but imagine yourself doing the activity very skilfully and the spectators and teammates showing their appreciation. Now close your eyes for about one minute and imagine the situation as vividly as possible.

a. Rate how well you saw yourself in this situation
   
   Rate: 1 2 3 4 5

b. Rate how well you heard the sounds in this situation
   
   Rate: 1 2 3 4 5

c. Rate how well you felt yourself making the movements
   
   Rate: 1 2 3 4 5

d. Rate how well you felt the emotions of the situation
   
   Rate: 1 2 3 4 5

e. Rate how well you controlled the image
   
   Rate: 1 2 3 4 5

f. Could you see the image from inside your body?
   
   Answer: yes no

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APPENDIX 18

Pre-Race Goal Setting Questionnaire

INSTRUCTIONS

Please complete the following questionnaires prior to your next competitive race

1. What standard is the current competition?
   Club [ ]
   University [ ]
   County [ ]
   Divisional [ ]
   National [ ]
   International [ ]

2. What race are you competing in (stroke & distance)?

3. What is your personal best time for this event?

4. What is your seasons best time for this event?

5. How important is this race for you?

   Not Important At All
   1  2  3  4  5  6  7  8  9
   Extremely Important
GOALS THAT MAY HAVE BEEN SET FOR YOUR NEXT RACE

"Goal setting" is about setting targets for performance. There are essentially three different types of goals that performers may set themselves for a race. These are: (1) outcome goals (the position you aim to achieve in the race); (2) performance goals (the time you aim to swim for the race); (3) process goals (e.g. achieving a fast start, streamlined turns, efficient stroke technique etc). For this study refer to the goals that may have been set for the next race. Please note that it is possible, to set more than one type of goal."

1. Have you set any goals for this race?
   YES [ ] NO[ ]

-------------------------------------------------------------------------------------------------------------------------------

OUTCOME GOALS

2. Have you set a position goal for this next race?
   YES [ ] NO[ ] (If No go on to Time Goals)

3. If YES please tick the box which corresponds to what this position goal is:
   1st [ ]
   Top 3 [ ]
   Top 6 /8 [ ]
   Another Goal [ ] (Please State: ________________________________)

4. Who set the position goal? (please circle the appropriate X symbol)

   Solely Yourself x x x x x x x
   Equally Agreed x x x x x
   Solely Your Coach x x x x

5. How difficult do you think it will be to achieve this position goal?

   Extremely Easy
   1 2 3 4 5 6 7 8 9

6. To what extent do you think you will achieve this position goal?

   Definitely No -4 -3 -2 -1 0 1 2 3
   Uncertain
   Definitely Yes 4
PERFORMANCE GOALS

7. Have you set a **time** goal for this next race?
   
   YES [ ]    NO[ ]  (If No go on to Process Goals)

8. If **YES** please tick the box which corresponds to what this **time** goal is:
   
   Personal Best [ ]
   Seasons Best [ ]
   Another Goal [ ] (Please State: _________________________)

9. Who set the **time** goal? (please circle the appropriate X symbol)

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10. How difficult do you think it will be to achieve this **time** goal?

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11. To what extent do you think you will achieve this **time** goal?

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PROCESS GOALS

12. Have you set a **process** goal(s) for this next race?

   YES [ ]    NO[ ]  (If No go on to Goal Importance)

13. If **YES** please indicate what your one primary **process** goal is:
14. Who set the process goal? (please circle the appropriate X symbol)

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15. How difficult do you think it will be to achieve this process goal?

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16. To what extent do you think you will achieve this process goal?

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**How Important Are Your Goals?**

16. **Position Goals**

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17. **Time Goals**

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18. **Process Goals**

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APPENDIX 19

Post-Race Goal Setting Questionnaire

INSTRUCTIONS
Please complete the following questionnaires following to your next competitive race

TIME GOALS

1. Did you set a time goal?
   YES [ ] NO[ ]

2. Did you achieve this time goal?
   YES [ ] NO[ ]

3. Was the time you achieved a:
   Lifetime Best [ ] Seasons Best [ ] Neither [ ]

4. Was your time better or worse than expected?

   Much Worse As Expected Much Better
   -4 -3 -2 -1 0 1 2 3 4

POSITION GOALS

5. Did you set a position goal?
   YES [ ] NO[ ]

6. Did you achieve this position goal?
   YES [ ] NO[ ]

7. Was your position better or worse than expected?

   Much Worse As Expected Much Better
   -4 -3 -2 -1 0 1 2 3 4
PROCESS GOALS

8. Did you set a process goal for the race?
   YES [ ]    NO [ ]

9. Did you achieve the process goal?
   YES [ ]    NO [ ]
APPENDIX 20

Social Validation Questionnaire

Directions:
Please complete the following questions relating to the personal psychological intervention study you have just participated in after the completion of your 10th and final competitive race. It is important that you are as honest as possible when answering these questions. For the questions please either circle a response number (from 1 to 7) or write in the space provided your own answers. Following the questions where you circle a response there is a space provided for anything at all you wish to say relating to that question. Please do not feel that you have to respond in a certain manner - just be totally honest and provide as much information as you can.

Part 1

GENERAL QUESTIONS

1. Did you know what the purpose of the study was? (please tick)
   YES [ ]    NO [ ]    UNSURE [ ]

2. If you answered yes please indicate what you thought the purpose was?

   ___________________________________________________________
   ___________________________________________________________
   ___________________________________________________________

3. Did it occur to you why you may have been selected for the study?

   ___________________________________________________________
   ___________________________________________________________
   ___________________________________________________________

4. Did you fully understand what was expected of you in the study?

   1 Not at all  2  3  4  5  6  7 Very much so

5. Did you stick rigidly to the order of practices and recommendations in the study?

   1 Not at all  2  3  4  5  6  7 Very much so
6. Do you feel that you were fully committed to the programme throughout the study?

1  2  3  4  5  6  7
Not at all  Very much so

7. Do you perceive that there has been any performance changes throughout this study?

1  2  3  4  5  6  7
Not at all  Very much so

8. Do you consider any of the performance changes that have occurred to be significant?

1  2  3  4  5  6  7
Not at all  Very much so

9. Has the procedure proved acceptable to you (i.e., the way you have been treated)?

1  2  3  4  5  6  7
Not at all  Very much so

10. Has the procedure proved useful to you (i.e., the content of the information that has been provided)?

1  2  3  4  5  6  7
Not at all  Very much so

11. Do you think you will continue to practise any of the skills that you have learnt?

1  2  3  4  5  6  7
Not at all  Very much so

12. Do you feel you have benefited from this programme? (please tick)

YES [ ]  NO [ ]

13. If YES, how do you feel you have benefited?

______________________________________________________________________________
______________________________________________________________________________

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14. If NO, why do you feel you have not benefited?

15. If you perceived that the procedure has contributed to enhancing your performance, could you comment briefly on why you believe this to be the case?

SPECIFIC QUESTIONS

Mental Imagery

16. In the pre-competition routine, how many times a week did you perform the mental imagery training?

17. When (time of day etc.) did you perform the mental imagery training in the pre-competition routine?

Physical Warm-Up

18. When did you complete this physical warm up prior to racing?

Part 2

Study Purpose

You were chosen for this study because from prior measurement (questionnaires you have completed for me in the past) it was evident that you interpreted both your cognitive (i.e. mental)
and somatic (i.e. physical) pre-race symptoms as debilitative (negative) towards your upcoming race performance.

The purpose of the study primarily, was to attempt to alter these negative pre-race interpretations to interpretations that were more facilitative and positive towards your upcoming race via the psychological skills you have completed. Bearing this in mind please answer the following questions.

19. Do you perceive that the intensity (i.e. the level or amount) of your pre-race cognitive anxiety has remained the same following the intervention (i.e. the races after the psychological skills were introduced to you)?

   YES [ ]  NO [ ]

20. If NO, how do you think the intensity of cognitive anxiety has altered?

21. Do you perceive that the intensity (i.e., the level or amount) of your pre-race somatic anxiety has remained the same following the intervention (i.e., the races after the psychological skills were introduced to you)?

   YES [ ]  NO [ ]

22. If NO, how do you think the intensity of somatic anxiety has altered?

23. Do you perceive that you are now interpreting your pre-race cognitive anxiety symptoms as more facilitative (positive) towards your upcoming race?

   YES [ ]  NO [ ]

24. Do you perceive that you are now interpreting your pre-race somatic anxiety symptoms as more facilitative (positive) towards your upcoming race?

   YES [ ]  NO [ ]
25. Do you feel more self-confident prior to your races following the intervention?
   YES [ ]  NO [ ]

A second purpose of the study was to educate you in the skills of goal setting. Specifically, to try and make you more process and performance oriented and less outcome oriented. The reason for this is that process and performance goals are more within your control than outcome goals because you cannot control the behaviour of other swimmers in the races. Bearing this in mind please answer the following questions:

26. Do you feel that you have altered the way in which you set goals for your upcoming race as a function of the goal setting information provided this study?
   YES [ ]  NO [ ]

27. If YES can you briefly explain why this is the case?

28. If NO can you briefly explain why this is the case?

29. Please indicate below if there is anything else you wish to say regarding anything at all relating the study you have just participated in? (continue on separate page if necessary).
APPENDIX 21

Goal Setting Education

The following written pages summarise what we recently discussed relative to the practice of goal setting, and highlights some important principles of good goal setting, the different types of goals that can be set and implications for setting goals for your future races. Goal setting is one of the most effective psychological methods at directing and motivating behaviour, but also if performed correctly can greatly enhancing self-confidence. The goals we all set underpin our actions and performances not only in the pool, but also for the races in competition. Effective and intelligent goal setting is not necessarily as straightforward as it may at first appear. Therefore, the goals you set should meet the following criteria which are known as SMARTER goals:

Specific
Specific goals are more effective than "do your best" goals or not setting a goal at all. Therefore, when you set goals for your remaining ___ races (as appropriate), make sure you know exactly what the goal is.

Measurable
It is essential that you are able to measure your goals accurately. This tends to be fairly straightforward in competitive swimming because a position is always reached and a time produced for the race.

Achievable
Goals should be challenging and difficult enough to provide a strong motivation, but realistic enough so that you fully accept the goal and believe you can achieve it. If you do not accept your goal or believe you can achieve it, then the goal can become negative and dysfunctional.

Relevant
Good goals should be targeted to a specific population (e.g. it would not be relevant to set a swimmer a goal to run a marathon). Within the sport of swimming it would not be relevant to set a sprinter the types of goals that a distance swimmer would aim to achieve. Therefore, try and make sure the goals you set are relative to your best events in terms of strokes and distances.
Time Phased
Good goals have a time frame to provide discipline in training and competition up to the achievement of that goal. In this study you have ____ (as appropriate) separate races to set and try and achieve your goals. Also, goals can be short-term (e.g. for the next training session), intermediate (e.g. for the race in five weeks time) and long-term (e.g. for a year ahead). We can discuss any longer term goals after the 10th race of the study.

Exciting
Effective goals should be exciting, you should be excited when you achieve them.

Written Down
It is advisable to write your goals down so that you are very clear what you want to achieve.

Different Types of Goals
There are essentially three different types of goal that you can set for your upcoming competitive races:

Outcome
An outcome goal would be to win the race, gain second or third place or position in the top eight to make a final appearance. Therefore it is the position you aim to achieve in the competition. This type of goal can act as a strong motivator; however, as we discussed, this type of interpersonal goals is not totally within your control, i.e., you cannot control in any way other swimmers' performance. You have no control over their performance, only yours. Therefore setting this type of goal on its own is external and not advisable, so set other types of goal in addition to solely outcome targets.

Performance
Performance goals are the times that are achieved in the race. These are more intrapersonal in nature, i.e., they are more under your control than outcome goals. You may set a goal for example to break 55 seconds for the 100 free. Performance goals feed outcome goals, i.e., if you achieve your performance goal there is an increased likelihood of achieving your outcome and position goal in the race. Setting performance goals is advisable providing they are realistic for your training phase. Remember that you may
need to modify your performance targets if you are in the intense training period of your training cycle.

**Process**

Process goals are separate component goals that can be set for the race. They are the sub-components of the race, which tend to be technical in nature but can also be psychological. For example, technically you can break your race down into a start, turns and finish and the biomechanical swimming action between the walls. You may set process goals to achieve a good start with efficient streamlining, fast efficient tumble turns, and achieve a long stroke throughout. Psychologically you may set process goals to stay focused on the technical aspects of your race for example, which can act as a buffer against anxiety and pressure. These intrapersonal goals are excellent goals to set for your races because they are totally under your control, and very internal. If you achieve all of your process goals there is an increased likelihood of achieving your performance goal and therefore achieving the outcome you desire. Process goal therefore feed the performance and the eventual outcome. Remember, if you achieve all of your process goals, then on that particular day there is probably nothing else you could have done to have improved your performance providing you did invest the necessary effort in the race.

Recent research into goal setting, anxiety and competitive swimming has illustrated that individuals who maintained a favourable perception of being able to achieve their race goals had significantly better pre-race psychological preparation than individuals who did not expect to achieve their goals. This was especially relevant for process and performance goals which are internal goals that are within the control of the individual swimmer.

**Important recommendations for practice:**

- Try and set goals that are within your control and maintain a positive perception of your ability to achieve them.

- Try and make the goals that you set follow the SMARTER criteria outlined before.

- Only set goals for your next ____ (as appropriate ) races and not longer term. Together this can be discussed following the study.
APPENDIX 22

Mental Imagery Scripts

Many of you may have heard or read of how great swimmers and other sports competitors have expressed how they mentally imagine and rehearse their performances in their minds as part of their psychological preparation. Indeed you may have had similar experiences in the past where you have imagined yourself swimming in different situations.

Mental Imagery is the term used when performers create or reinact a picture or situation in their minds, usually where they are heavily involved in that picture, i.e., they actually take part, and the image is centred around them. Many individuals involved in sport (including yourself) posses the ability to not only see the picture, but they can also feel and hear what goes on in the image.

You are all familiar, I know, with this psychological skill, both internal imagery (where you see yourself swimming from the inside of your own body as if you were looking through your own eyes) and external images (as if you were a spectator watching yourself move through the water) and have used it regularly in the past. You will also be familiar that other sensations can accompany these images, such as kinaesthetic feeling (the feel of the water on the hand) and in some cases smells (of the pool chlorine, for example), and noises (the splash of the water or the sound of the starting gun or crowds). However, you may not realise that imagery has a wide variety of uses and is one of the most powerful of all psychological skills. For example, the wider uses of imagery are rehabilitation of injury, practising and improving certain sport specific skills (e.g. relay take-overs), rehearsing race situations to prepare for every eventuality and importantly mentally rehearsing actually being in a confident frame of mind. The principle behind imagery is the more you rehearse something in your mind, the more you teach yourself (your mind and body) to act out the image in the real situation. You become more self-confident, prepared and ready for any situation that you have rehearsed.

Reports from elite competitive swimmers suggest that they use imagery in two separate ways. Firstly, in the weeks leading up to a competition and secondly in the pre-race period, 30 minutes or so before the race. In the pre-competition phase (i.e. in the weeks preceding a competition) they image when actually swimming in the pool in training (making a very specific form of imagery in the correct environment) to aid practising the
important processes that are vital for competing, such as tumble turns and streamlining. They also use imagery out of the pool to reinforce and practise these skills, and perform mental rehearsals of their upcoming races.

One of the major uses of the elite swimmer's imagery sessions focuses around simulating the thoughts and feelings they experience prior to an important competition and rationalising the resulting symptoms to themselves.

On the day of the race, elite swimmers tend to be less concerned with external factors (i.e. factors which are largely outside of their control) in their images such as opponents they may be racing or the actual outcome of the race (i.e. the position they have set a goal to achieve) and more concerned with internal factors (i.e. within their own control) such as performing good and efficient separate skills within the race (the race processes) such as fast start and dynamic tumble turns or long stroke techniques. Focusing on more internal factors has helped these elite swimmers develop and maintain a very positive perspective on their pre-race mental preparation, by for example, not concerning themselves with race opponents and other external factors outside of their control. Other images that may be part of their psyching up or mental preparation include imaging positive aspects of the race, for example imagining the feel and power of an effortless efficient flowing stroke.

Imagery will be the primary psychological skill that forms the focus of your personal psychology plan in the pre-competition phase and to a lesser extent just before the race, and you will be guided closely on the imagery techniques used by information described by some of the best swimmers in the world. Specifically, each type of imagery practice I advise you to follow is described on the following pages. A brief description of the different imagery practices will be provided followed by a suggested script (including internal and external perspective techniques) which is personal to you. This script will be provided for you on an audio tape with my voice guiding you through the structured imagery routines. Finally, a recommended practice time for that specific imagery routine will be provided.

In order for you to benefit to the full from your imagery sessions please try to continue to create images which are very clear, vivid and controllable as possible. You should attempt to have total control over what happens in the image, and therefore directing the situation in the swimming pool as you want.
PRE-COMPETITION IMAGERY TRAINING

The following individual imagery routine is to be performed in the weeks and days leading up to your competitive races. It is recommended that you practice this as much as possible but a minimum of three separate sessions per week in the period leading up to your next and subsequent swimming races.

This mental imagery training session is structured into three main sections:

Section 1 will attempt to simulate the thoughts and feelings you typically experience prior to competing, and attempt to get you thinking about these symptoms in a slightly different light to what you may have done previously.

Section 2 of the routine will involve imaging yourself performing skills of your choice relative to your number one competitive stroke and race event many times over, rehearsing them in your mind. For example, if you race over 50m freestyle, image a fast and explosive start entering the water with little resistance and making a powerful transition into the stroke with arrow-like streamlining. By practising in this way you will not only improve and refine the skills you use regularly in competitive race but concentrate on skills that are totally within your control, and therefore avoid focusing on so-called external factors such as your opponents in the race. Thoughts in your mind are therefore appropriate and totally within your power and control.

Section 3 repeats the mental skills of Section 2 but explains the benefits of performing these types of images while actually swimming in the water in training sessions.

More specific details will be provided prior to the start of each section on the audio tape.

Excellent imagery sessions are aided by you being physically and mentally relaxed and feeling very comfortable. A brief relaxation session will precede each part of the imagery session on the audio tape.
Welcome to Section 1 of your personal imagery session. The purpose of this session is to attempt to recreate your pre-race thoughts and feelings via mental imagery and then restructure and review the way that you typically interpret and perceive them. Basically, together, we will attempt to get you thinking about these symptoms in a slightly different fashion to the way you are used to via some self-statements and self-talk strategies.

I want you to think of a particular competition where you were very nervous and worried prior to the race, and also thought that the way you were feeling and the thoughts you had were negative towards how you were going to perform in the race. For example, you may have felt excessively worried about an opponent, a close rival for instance, and then thought negatively about the outcome of the race. Perhaps you lost concentration totally and panicked to a certain degree. I want you to now try and relive the thoughts and feelings that you experienced. Imagine how your body felt, the butterflies in your stomach, your hands sweating and feeling a little sick as you waited to perform. Remember, the thoughts that went through your head, for example worries about where you would place in the race or concern about performing up to expectation or in front of others.

I will give you a few moments to do this (pause 30 seconds - 1 minute).

Now that you have done this, it is very important to recognise that many swimmers and other performers in other sports experience these feelings especially when the race or event they are about to compete in is very important to them for whatever reason. Negative and debilitative interpretations of how you feel before a race can sometimes act positively in helping you psychologically prepare. However, in the majority of cases as you know, it only serves to distract your concentration and can badly affect the way you perform in the pool. Thinking differently and talking to yourself positively, where you focus and concentrate on reviewing the true meaning of these symptoms is a constructive and very effective solution to these negative thoughts.

Bearing this in mind I want you to review the situation and then attempt with my guidance to mentally restructure it. To expand, I will now guide you so that you to change anything that you think and physically feel which you perceive as being negative for your swimming and replace it with positive phrases and images.
Firstly, focus on how you feel physically - the feelings that are running through your body as you wait to race. Feel the butterflies in your stomach, the tension in your shoulders and the slightly sick feeling that you may have. Now I want you to try and change the way you think about these physical symptoms by telling yourself that you need, and you really must be physically feeling this way to perform well in the pool. Explain to yourself that this is your body's way of letting you know that it is ready to perform optimally for you when you hit the water.

Just spend a moment or so repeating these positive phrases to yourself. Therefore, at the same time as you are experiencing these physical symptoms tell yourself that you need these symptoms, you must be aroused and your body is simply letting you know you are ready to perform very well. I will return shortly after you have done this (break 30 seconds).

Now, because of the nature of your race (i.e. you have to be physically and mentally pumped up to exert maximum effort for a period of 25 seconds - 2 minutes for example) it would not be wise or the correct thing to do to reduce the level of these symptoms, you need them like this, but instead try and think about them differently.

For example, say to yourself that you have chosen to be in this sport, so you choose to accept that you cannot avoid these physical feelings. Accept that they are natural feelings, that everyone experiences, and that they are definitely a good thing for your swimming. Try and revel in these feelings and enjoy the state your body is in right now. Most importantly of all it is crucial that you realise that the way you are physically feeling really can improve your swimming race performance. Your body is giving you positive signals that it is ready.

Now I want you to focus on the thoughts that are going through your head prior to this race. You may be pre-occupied with racing a close rival, where you will actually finish in the race - both maybe with images that may be negative, i.e., being beaten by the rival for example. Just think about these thoughts for a second - these thoughts only mean that you are very concerned about your upcoming race which is definitely very positive. Remember you require these thoughts to illustrate the race importance. They simply mean that you care about what you are going to do. These thoughts will not harm you in anyway, and they mean that you are willing to invest a great deal of effort in your upcoming race. Try and focus on more positive images such as the excellent processes you will complete in the race. For example mentally rehearse your start or turns (you
will learn to do this even more efficiently in Section 2). Very importantly go over your personal race plan. This will not only act as a reminder of how you want to swim the race but stop you thinking negatively about other things. Let others panic and worry about how they feel and interpret their thoughts and feelings negatively, but you let these work for you. Now just spend a few minutes focusing on these things I have said and realise the full positive advantage that can be gained from thinking this way (break 1 minute).

Just try for a few seconds imagining yourself on the poolside saying to yourself that you are concerned about the race which is very positive and the way you are feeling is a definite indication that you are ready to compete. Try and see and feel yourself in a new frame of mind. Look forward to your next race situation where you will actually be feeling like this and really enjoy it.

This just about brings us to the end of the first part of your imagery training. When you feel confident you can restart the tape and experience Section 2. As you start the tape again you should feel very confident about how positive pre-race thoughts and feelings can be when you think about the symptoms slightly differently to the way you have before. The physical feelings you experience signal to you your body is aroused and activated to perform optimally for you and your pre-race thoughts signal concern and willingness to invest effort in the race. They are definitely a very positive experience for your swimming. Try and practise recreating your thoughts and feeling at least three times each week leading up to your races, and restructuring them towards a much more positive focus.

You can stop the tape now.

**Section 2: FOCUSING ON RACE PROCESSES WITHIN YOUR CONTROL**

Welcome to the second section of your imagery training session. You will now experience some imagery techniques relative to certain individual race processes that you perform in your swimming races. The main purpose of this part of the imagery session is to remember that these factors, such as excellent turning skills and streamlining, are totally within your control and it is more positive to focus on these factors than things you have no power over. Recognise that there is nothing you can personally do about how an opponent will swim or to a lesser degree the outcome of the race, the height of the starting blocks, lane draw or the water temperature. Recognise and accept totally that
these affect everyone equally. However, there is much you can do to make sure your race is as good as it can be. One way of trying to ensure this is to focus on your own personal race process goals. For example, if you start well, hold good technique, turn well and stick to your race plan then on that particular day there is nothing else you could have done to have improve your performance. Think about that for a second and now enjoy focusing on factors that really are within your control.

The aim of this part of the imagery session is to enhance and refine your imagery skills relative to the most important race processes for your number one stroke and event. In the following few minutes I will take you through mentally rehearsing a freestyle turning skill, one of the most important processes where performances can be greatly improved. Following this I will ask you to note down the most important processes for your race and practise imaging them. These are the type of images that will be useful in the time prior to your next race in your pre-race psychological preparation.

Initially, I want you to see yourself swimming up the length of a short course pool. Try and imagine this from an external perspective where you actually see yourself as if you are a spectator watching on a TV screen or from the spectators gallery. Picture yourself powerfully and efficiently moving towards the wall where you will execute a perfectly timed, fast and efficient tumble turn. See the rhythm of your arm stroke recovery, your powerful balanced leg kick, and efficient breathing pattern. Just focus on yourself for a few moments and what you look like swimming towards the wall (break 15 seconds)

Now move into an internal perspective, look through your own eyes and feel yourself moving through the cool crisp water. I want you to see and feel your hands enter the water in front of you. See and feel clearly your hands break the waters surface with some small air bubbles as they surge forward finding the catch position at the front of your stroke. You have an excellent feel of the water so try and feel the pressure of the water on the palms of your hands and your forearms. Try and hear the sounds your hands and arms make as they efficiently break through the water.

As you move towards the wall you will see the black 'T' bar at the bottom on the pool five meters away from the wall. This is the signal for you that it is now time to execute a fast and powerful process, one where you can greatly improve your race performance. Feel and see yourself take your last breath and now visually spot the wall very accurately. Try and imagine every detail on the wall or timing pad. You will be able to see the separate tiles on the wall or the grooves on the bright yellow timing pad. Feel confident
that you are going to hit wall full on. Now see and feel you last arm stroke that takes you close to the wall and execute a powerful dolphin flip kick to aid your momentum. See and feel your legs kick powerfully. Now see and feel your hands skull inwards and back as your legs flip with tremendous speed over your body. You plant your feet firmly on the wall with legs bent at 45 degrees. As you feel your feet hit the wall, you can see the bottom of the pool clearly as your body twists round so you are once again on your front and your arms are in a fully extended state above your body in preparation for a powerful drive from the wall. Now imagine and feel the extension in your legs as you drive from the wall with your head tucked tightly between your ears, arms above your head as you streamline from the wall in preparation for your next length of the race. Can you feel the pressure your arms are producing on your ears as you are in an arrow like streamlined position. You leave the wall and start up your powerful kick up to the surface ready to take your first stroke without taking a breath.

Once you have performed this skill try and repeat it in slow motion and then speeding it up. Try and imagine every detail executing the turn perfectly in slow motion and then perform the turn at a speed that is faster than you would normally in the race. You can also practise observing this from an external angle. I will give you a few minutes to practise these different mental imagery perspectives (break 2 minutes).

Congratulations on performing an excellent tumble turn, a turn which greatly improved your race performance. You can repeat this as many times as you wish, however, it is important that in your own time you (with my help) break down your race into the most important race processes and repeatedly practise imaging them from the start to the finish of your race. This way you will learn to mentally rehearse a technically perfect race where you successfully achieve your race process goals without any external factors influencing you. This will be of tremendous use in the pre-race period when it is crucial you focus on factors you can control.

Section 3: ADDITIONAL TRAINING IMAGERY
RACE PROCESS FOCUSING WHILE ACTUALLY SWIMMING

This repeats the previous exercise where you image race processes, such as turns and streamlining, but while actually in a training session in the pool. Therefore using the example you practised in Section 2 of the tumble turn, if you are performing a long distance set in your training session, spend a little time imaging the turn prior to physically executing the skills. This is particularly relevant for imaging your start, stroke.
technique, turns and streamlining because you do these skills continually throughout the training session.

There is no structured script for water based imagery. Try to follow the same sorts of imagery practise that you practised in the dry land imagery (Section 2) focusing intuitively on the race process skills that are most specific to your main competitive event. Remember the more you practise while actually in the water, the more efficient your psychological imagery skills will become and the more effective your personal mental training programme. Importantly, when swimming repetitions try and image the entire race and simulate the different parts as closely as you can.

It is recommended, that as you have a large amount of time to think while actually swimming training, you practise this kind of imagery in at least three water training sessions per week. The amount of time you spend while actually in the water will be very individual but continue with the practise as long as their is quality, vividness and control.
APPENDIX 23

Pre-Race Routine

Please follow this routine (which is divided into five sections) in the period preceding your next ___ (as appropriate) competitive races. It is suggested that you start this routine after your water warm-up period and approximately 30 minutes before you will compete.

Part 1: Decision Time

This denotes a specific time when you are ready to start thinking about your next race. It will be after the water warm-up period, and probably approximately 30 minutes before the whistle goes for your race. Prior to this time when you want to start thinking about what you are going to do in the race, try and avoid thinking about the race. Avoiding thinking about something is referred to as dissociation and can be very useful. The reason for this is that thinking about the race for too long in advance can be detrimental to performance via possibly increasing your anxiety levels and also possibly wasting nervous energy. Try dissociation tactics such as talking to other people (but not about swimming) or lying down and forgetting about the race while listening to a walkman. You may want to go away from the poolside to do this, to somewhere cool perhaps.

When you feel ready to start thinking about the race make a committed and conscious decision to do so. This is the time when you will follow the other parts of your pre-race mental preparation routine and turn on your concentration close to the start of the race.

Part 2: Positive Thinking & Self-Talk

Virtually all swimmers and other sports competitors talk to themselves at some time during their training sessions, before competition and actually during swim races. Some swimmers openly talk to themselves out loud while others talk by thinking to themselves. Self-talk is a very widely used technique and can be used positively by increasing self-confidence, maintaining concentration and providing constructive and appropriate thoughts, therefore enhancing performance in the pool. Unfortunately, however, it can act negatively, by lowering self-confidence and producing anxiety when everything does not go to plan. Therefore it is vital that you talk to yourself in an appropriate and positive way.
Once you decide it is time to start mentally preparing yourself prior to the race, the first thing to do is to focus on some positive thoughts and repeat some positive self-statements to yourself. Start by thinking over past previous good race performances where you swam well and were pleased with your performance. Think over the race in detail and remember how satisfied you felt upon completing a good performance. I suggest you write these down on the cards provided to maximise this procedure.

Next, think over some recent training sessions and specific training sets where you have swam well and draw confidence from these for your upcoming race. Again, you could write them down tell yourself how well you did in those training sessions. Tell yourself and repeat a number of times how well you did in training, which means and indicates you are fit and absolutely ready to race in your next event.

**Part 3: Mental Imagery Practise**

This type of imagery is appropriate in the period prior to your next competitive races. Some of the imagery skills I am advising you to perform will have been practised extensively in your pre-competition imagery sessions.

There is no imagery audio script for this time period, because it is not practical to listen and focus on a tape of this nature while actually waiting to race.

When you perform this imagery you will be in your pre-race period with only a short amount of time to go until you compete. Remember the aim of your pre-race imagery is to focus and concentrate as positively as possible banishing all negative thoughts from your mind - they will only affect your race badly. In the pre-race period firstly, image a technically perfect race as you have done many times over in your pre-competition imagery training sessions. The processes of a technically perfect race (start, turns, stroke technique etc.) are all within your control and cannot be affected by external factors such as your opponent. Focus on these - this will help you tremendously in the race. One added advantage is that now you are at the competition venue your images can be even more specific to the pool in which you will race. Make sure you image your race plan down to every little detail making sure you know exactly what you want to do at each stage of the race.

When you image the race plan in your mind, incorporate the imagery of the race processes and also some of the following aspects.

- Imagine yourself very **successfully** executing the strategy that you intended during the race (for example, even splitting the first and second hundred etc.)
• In this race you will image very positive aspects of the race such as how good your stroke feels, the excellent feel of the water, and successfully achieving your race process goals.

• Image just how much you want to race and actually enjoy pushing yourself to optimum performance.

**Part 4: Self-Talk & Reminder Cue Cards**

These cards can be looked at and read over at any time prior to your race when you feel that you are activated, aroused and ready to compete. By reading and repeating the phrases to yourself you are making sure that the thoughts and feelings you are experiencing are very appropriate for your upcoming race. It is advisable that you write these out yourself in your own writing on the cards provided.

My thoughts signal that I am **concerned** about the race
Thinking this way means I am **very willing** to put a great deal of effort into this race
These thoughts will **not harm** me in any way
My body is indicating that I am **ready** to race - it is **activated** to perform very well
I **accept** the way I am physically feeling - my body is giving me positive signals
I **need** to feel this way to perform very well
I **like** and **want** to feel this way
I am **working** these feelings to my **advantage** to perform well
These feelings are **natural** and definitely a **good** thing for my race

**Part 5: Physical Warm Up**

This can be completed at any time before or after the water warm-up period. Please stick to your usual flexibility and dry land routine; however, please make sure that you spend approximately the same amount of time performing this routine prior to each race you compete in.

**This routine should be practised once prior to every competitive race.**