Stephen D. Mellalieu
Sheldon Hanton
David Fletcher

A COMPETITIVE ANXIETY REVIEW

Recent Directions in Sport Psychology Research

NOVA

A COMPETITIVE ANXIETY REVIEW: RECENT DIRECTIONS IN SPORT PSYCHOLOGY RESEARCH

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STEPHEN D. MELLALIEU, SHELDON HANTON AND DAVID FLETCHER

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PREFACE

This book provides a review and discussion of the recent move towards the positive aspects and consequences of competitive anxiety. Following a description of competitive stress-related terminologies, conceptual and psychometric developments are considered including the notion of directional anxiety interpretations. The commentary then focuses on the theories and models that outline the potential positive aspects of anxiety in relation to athletic performance. Applied implications and future research directions are also discussed together with a number of explicatory statements regarding the nature of the precompetitive stress experience in sport.

Keywords: Competitive stress response, sporting performance, positive consequences, direction

Chapter 1

INTRODUCTION

The topic of competitive anxiety has enjoyed a large prominence in the sport psychology literature, and is often cited as one of the most studied areas in the discipline (Biddle, 1997; Jones, 1995a; Tenenbaum and Bar-Eli, 1995; Woodman and Hardy, 2001). A number of reviews have been published that have periodically provided both a comprehensive and contemporary review of the literature (e.g., Burton, 1998; Gould, Greenleaf, and Krane, 2002; Hardy, Jones, and Gould, 1996; Jones, 1995a, 1995b; Smith, Smoll, and Wiechman, 1998; Woodman and Hardy, 2001). Collectively, these offer an interesting and informative insight into the relationship between competitive anxiety and performance, while separately each emphasizes different aspects of the association. For example: Jones (1995a) commented on measurement and design advances; Burton (1998) outlined the development of measures of the state response; Smith et al. (1998) discussed the re-conceptualization of trait anxiety in sport; Woodman and Hardy (2001) reviewed the cognitive aspects of the anxiety-performance relationship; and Gould et al. (2002) presented an integrated perspective of the measurement of arousal, activation, anxiety, and performance.

Since anxiety is a negative emotion, researchers have historically tended to focus on the potentially negative effects on performance. However, a theme that emerges from some of the reviews (e.g., Jones, 1995a; Woodman and Hardy, 2001) is that, under some circumstances, anxiety can have positive consequences in performance environments. Jones (1995a) remarked that:

> The experience of competitive anxiety has, particularly in the North American sport psychology literature, been viewed as negative and to have debilitative consequences for performance. This view is, however, at odds with a body of literature which has emanated from other areas of psychology

> which suggests that anxiety can sometimes have positive consequences. (p. 462)

Despite acknowledging the importance of the benefits of anxiety in sport, no single body of work has focused upon this area to any great extent. Consequently, in this chapter we explore in greater detail the mechanisms by which such a negative emotional response might have a positive effect on a performer's psychological state and subsequent athletic performance. To the best of our knowledge this review is the first to focus specifically on this area and discuss recent directions in sport psychology research which examine this phenomenon.

This chapter comprises five sections. The opening section summarizes the conceptual distinctions in the terminology adopted in the study of competitive stress and provides a brief overview of the extant literature examining competitive stressors in sport. The remainder of this chapter focuses on the study of the competitive anxiety response itself. First, the major historical, conceptual and psychometric developments are identified, such as state-trait and multidimensional (i.e., cognitive and somatic) conceptualizations and the various instruments developed to measure the construct. Next, we discuss recent advances in competitive anxiety research, including frequency of symptoms experienced and performers' directional interpretations of symptoms associated with the response. Here, we describe the origins of direction, the mechanisms underlying the concept, and its context in the competitive stress process. The wealth of literature that has investigated potential moderators of the direction response is then discussed together with some key issues that have recently arisen relating to positive consequences of symptom interpretation for performance. The next section then describes the models and theories that consider these potentially positive aspects of anxiety upon performance. Finally, the remainder of this chapter presents applied practice implications and outlines future areas for research, including a series of explicatory statements regarding the competitive stress experience in sport.

Chapter 2

DEFINITION OF TERMS

The study of competitive stress and anxiety in sport has been hindered by a lack of consistency in the use of key terms (Burton, 1998; Gould et al., 2002; Hardy et al., 1996; Jones, 1995a; Jones and Hardy, 1990; Woodman and Hardy, 2001). For example, stress has often been used interchangeably to describe a stimulus or a response of a person-environment interaction. This is despite there being a clear conceptual distinction between the terms 'stressor' and 'strain' (Beehr, 1998; Beehr and Franz, 1987; Fletcher, Hanton, and Mellalieu, this volume). 'Stressors' refer to events, situations or conditions, while 'strain' describes an individual's negative response to stressors. In the sporting arena, performers encounter a variety of competitive demands and react in different ways.

Contemporary conceptualizations view 'stress' not as a factor that resides in either an individual or the environment but rather as a relationship between the two (Lazarus, 1981). Researchers have argued that a transactional, rather than an interactional perspective, should be adopted to emphasize the relational meaning construed by an individual operating in a particular environment (cf. Fletcher et al., this volume; Lazarus, 1999). Here, transaction refers to the dynamic relationship that occurs between the environmental demands and a person's resources, while relational meaning describes the meaning a person construes from his or her relationship with the environment. Stress has, therefore, been defined as:

> An ongoing process that involves individuals transacting with their environments, making appraisals of the situations they find themselves in, and endeavoring to cope with any issues that may arise. (Fletcher et al., this volume)

In line with the conceptual standpoint adopted by Fletcher et al. (this volume), the following definitions of competitive stress related terms are presented:

- *Competitive stress*: an ongoing transaction between an individual and the environmental demands associated primarily and directly with competitive performance.
- *Competitive stressors*: the environmental demands (i.e., stimuli) associated primarily and directly with competitive performance.
- *Competitive strain*: an individual's negative psychological, physical and behavioral responses to competitive stressors.
- *Competitive anxiety*: a specific negative emotional response to competitive stressors.

For the purposes of clarification, the potential effects of competitive stressors on individuals are not inherently negative. Indeed, the competitive stress process can result in positive psychological and performance consequences. Traditionally, however, researchers have tended to combine athletes' perceived 'sources of stress' with their emotional responses, rather than focusing on the relationship between aspects of the stress process (Fletcher et al., this volume; see also Hanton, Fletcher, and Coughlan, 2005). Arguably, this has led to an assumption that all competitive stressors and responses are associated with negative connotations.

Chapter 3

COMPETITIVE STRESSORS

Investigations of competitive stressors have tended to focus on two main lines of inquiry, namely the preperformance stressors encountered by athletes and the antecedents of the competitive anxiety response. The study of competitive stressors largely emanates from a body of literature that has used qualitative interviews to study elite athletes general experiences or 'sources of stress' (e.g., Gould, Jackson, and Finch 1993a, 1993b; Hanton, Fletcher, et al., 2005; Holt and Hogg, 2002; James and Collins, 1997; Noblet and Gifford, 2002; Scanlan, Ravizza, and Stein, 1989; Scanlan, Stein, and Ravizza, 1991). A range of stressors have been identified including: the physical preparation of the athlete; the level of opposition; pressures and expectations to perform; team atmosphere; relationship issues with significant others; the nature of the event; and issues regarding self-presentation and social evaluation. These potential sources of strain illustrate the highly demanding environment of the competitive sport arena.

In a related line of inquiry, researchers have also examined the specific antecedents of competitive anxiety (e.g., Anshel and Wells, 2000; Hammermeister and Burton, 1995, 2001; Hanton and Jones, 1995, 1997; Jones, Swain, and Cale, 1990, 1991; Krane, Williams, and Feltz, 1992; Lane, Terry, and Karageorghis, 1995). These include: perceptions of readiness for peak performance (Hanton and Jones, 1995; Jones et al., 1990; Lane et al., 1995); the performers' attitude toward previous performances (Jones et al., 1990); and perceptions of environmental conditions and position goal (Hanton and Jones, 1995, 1997; Jones et al., 1990). Research also suggests that differences exist as a function of both personal and situation characteristics, such as gender (Jones et al., 1991), skill level (Hanton and Jones, 1997), and the nature of the sport (Krane et al., 1992). For example, females' cognitive anxiety responses have been shown to be predicted by

readiness to perform and the importance of doing well, while males' cognitive anxiety responses have been predicted by their opponents' ability in relation to themselves and their perceived likelihood of winning (Jones et al., 1991).

Chapter 4

COMPETITIVE ANXIETY

This chapter provides an overview of significant advances in the conceptualization and measurement of competitive anxiety. It is not our intention here to comprehensively cover these developments; more detailed descriptions can be found in other reviews such as Burton (1998), Jones (1995a) and Smith et al. (1990). A major advance occurred when researchers identified anxiety as a response to specific situations rather than solely a unitary phenomenon across all contexts. Situation-specific measures were subsequently developed in areas such as test anxiety (Mandler and Sarason, 1952), audience anxiety (Pavio and Lambert, 1959), and fear of negative evaluation, social avoidance and distress (Watson and Friend, 1969), and found to be better predictors of behavior than general anxiety scales. In sport psychology, a number of sport-specific instruments such as the Sports Competition Anxiety Test (SCAT; Martens, 1977) and Competitive State Anxiety Inventory (CSAI; Martens, Burton, Rivkin, and Simon, 1980) were also found to be better predictors of competitive anxiety than existing general measures such as the STAI (see Burton, 1998; Martens, Vealey, and Burton, 1990).

Spielberger (1966) then developed a state-trait theory of anxiety in response to criticisms that existing measures such as the Manifest Anxiety Scale (MAS; Taylor, 1953) and IPAT scale (Cattell, 1957) assessed dispositional traits, and failed to consider fluctuations in transitory or immediate emotional states (Smith et al., 1998). Spielberger (1966) described state anxiety as varying from moment-to-moment and fluctuating proportionately to the perceived threat in a situation. Trait anxiety refers to a predisposition to appraise situations as threatening resulting in state anxiety. The State Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, and Luschane, 1970) was subsequently developed to assess both state

and trait components and has been adopted by researchers to assess responses across a range of domains including sport (cf. Smith et al., 1998).

Another conceptual advance was the separation of anxiety into the components of cognitive and somatic anxiety (Borkovec, 1976; Davidson, 1978; Davidson and Schwartz, 1976; Liebert and Morris, 1967; Schwartz, Davidson, and Goleman, 1978; Wine, 1971). Morris, Davis, and Hutchings (1981) defined cognitive anxiety as 'the cognitive elements of anxiety, such negative expectations and cognitive concerns about oneself, the situation at hand and potential consequences' (p. 541); and somatic anxiety 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). Following the introduction into sport psychology of this multidimensional conceptualization of anxiety, Martens and colleagues (Martens, Vealey, Burton, Bump, and Smith, 1990) developed the Competitive State Anxiety Inventory-2 (CSAI-2) to measure the intensity of performers' cognitive and somatic responses, and also self-confidence. Subsequent research employing the CSAI-2 has provided evidence to support the separation of cognitive and somatic components as a function of antecedents (Gould, Petlichkoff, and Weinberg, 1984; Jones, Swain, and Cale, 1990; 1991), temporal characteristics (Gould et al., 1984; Jones et al., 1991; Martens et al., 1990), performance outcomes (Burton, 1988; Gould, Petlichkoff, Simons, and Vevera, 1987; Jones and Cale, 1989; Parfitt and Hardy, 1987, 1993), goal attainment expectancies (Krane et al., 1992) and in response to interventions (Burton, 1990; Maynard and Cotton, 1993). A trait version of the CSAI-2, the Competitive Trait Anxiety Inventory-2 (CTAI-2), and the Sports Anxiety Scale (SAS; Smith, Smoll, and Schutz, 1990) have also been developed to assess multidimensional competitive trait anxiety (e.g., Albrecht and Feltz, 1987; Eubank, Collins, and Smith, 2002; Jones and Swain, 1995; Smith, Smoll, and Barnett, 1995; White and Zellner, 1996).

Up to this point researchers in competitive anxiety had solely focused on the assessment of the 'intensity' of the response. Intensity refers to the amount or level of the symptoms experienced by an athlete. Recent developments suggest, however, that a greater understanding of the anxiety response may be gleaned by considering additional dimensions of the response. Such an approach has also helped to explain the potential positive aspects of the response to competitive stress. The next two sections consider research that has examined the frequency with which anxiety symptoms are experienced and performers' directional interpretations of these symptoms with regard to performance.

FREQUENCY OF COGNITIVE INTRUSIONS

Frequency of cognitive intrusions refers to the amount of time (expressed as a percentage) that thoughts and feelings about the competition occupy a performer's mind (Swain and Jones, 1993). The conceptual rationale for the study of this dimension derives from the temporal nature of the transaction process that views the competitive stress response as a product over time (e.g., Lazarus and Folkman, 1984). Consequently, it is important that psychologists consider the dynamics of the ongoing process in order to establish how stressful events are managed (cf. Folkman and Lazarus, 1985). Interestingly, research also suggests that individuals are able to more accurately recall the frequency over the intensity of their responses (Diener, Sandevik, and Pavot, 1991; Kardum, 1999; Thomas and Diener, 1990). Intensity information is suggested to be difficult to encode because there is no natural system by which emotional intensity can be defined by the individual. Conversely, it is hypothesized that humans are biologically more prepared to store and review frequency based information (Diener et al., 1991).

Traditionally, the time to event paradigm has been adopted to examine the temporal nature of performers' anxiety responses at intervals prior to competition (i.e., 7 days, 48 hours, 24 hours and 1 hour). A wealth of research has examined how the intensity of an athlete's precompetitive response differs in the lead up to competition (for a review, see Cerin, Szabo, Hunt, and Williams, 2000). Generated from Martens, Vealey et al.'s (1990) work on Multidimensional Anxiety Theory (MAT), several predictions were proffered regarding temporal changes in the intensity of symptoms. Somatic anxiety was hypothesized to increase to a peak prior to competition and then subside, while cognitive anxiety and self-confidence would remain relatively stable during the precompetition period as long as expectations regarding performance remained unchanged. Findings from subsequent studies broadly supported these predictions (e.g., Caruso, Dzewaltowski, Gill, and McElroy, 1990; Gould et al., 1984; Krane and Williams, 1987; Martens, Burton, et al., 1990; Swain and Jones, 1991, 1993; Wiggins, 1998) with several variables observed to moderate changes in anxiety levels over time. These included: sex and gender role endorsement (Jones and Cale, 1989; Jones et al., 1991; Swain and Jones, 1991, 1993; Wiggins, 1998); skill level (Perkins and Williams, 1994); sport type (Krane and Williams, 1987); level of competition (Davids and Gill, 1995); competitiveness (Jones and Swain, 1992); success and failure (Caruso et al., 1990; Jones et al., 1991); and perceived ability (Hall, Kerr, and Matthews, 1998).

In addition to the MAT predictions, Swain and Jones (1993) suggested that the intensity of state anxiety one week when compared to one hour before

performance did not equate to a complete reflection of an athlete's emotional state. In other words, a similar intensity of symptoms does not necessarily mean that the overall affective state is identical. Based upon their preliminary investigation in 1991, Swain and Jones (1993) added a frequency scale to each item of the CSAI-2 asking the participant to respond to "How frequently do you experience this thought or this feeling at this stage?" on a continuum ranging from 1 ("*never*") to 7 ("*all of the time*"). Change-over-time comparisons (2 days, 1 day, 2 hours, 30 minutes prior to competition) revealed that while the intensity of cognitive anxiety remained stable across the data collection points the frequency of such symptoms significantly increased as the event approached. Temporal patterning for somatic anxiety intensity and frequency was found to be congruent, with both dimensions showing progressive increases as the event neared. For self-confidence both the intensity and frequency of responses remaining unchanged over the 2 day pre-event period.

The implication from these findings is that researchers need to consider not only the intensity of the competitive anxiety response but also the frequency with which symptoms are experienced. An additional dimension that has received increasing attention -- and also alludes to positive performance consequences -- is the notion of directional interpretations of anxiety symptoms.

DIRECTIONAL INTERPRETATION OF SYMPTOMS

> The responsibility as England's kicker does scare me. I worry all the time about it, but the important thing is that I know I can worry about it. It's not a bad thing, or a detrimental thing, to worry. As long as when I go to take the kick, my routine is there, and my visualization, I can be as fearful as I like and think: 'I'm really, really concerned about this'. But as long as everything is in place, the ball will go where you want it to. (Wilkinson, 2003, p. 47)

This quote from Johnny Wilkinson, the England Rugby Union team's goal-kicker, illustrates the notion that anxieties associated with sport performance do not necessarily have negative connotations with regard to performance. The first sport psychology investigation to allude to the potential positive consequences of anxiety on performance was conducted by Mahoney and Avener (1977). They compared the psychological skills used by United States gymnasts who were either successful or unsuccessful in qualifying for the 1976 Olympic Games, with qualifiers reporting that they used their anxiety as a stimulant to better performance. This theme was resurrected in the early 1990's following a series of

investigations that questioned the traditional view that increases in competitive anxiety were negative to performance (cf. Martens, Burton, et al., 1990), instead suggesting that performance can be enhanced by increases in intensity levels (e.g., Jones and Cale, 1989; Jones, Cale, and Kerwin, 1988; Parfitt and Hardy, 1987). Consequently, Parfitt, Jones, and Hardy (1990) and Burton (1990) suggested that anxiety-related symptoms could be perceived by some athletes as facilitating mental preparation and performance.

Based on these suggestions Jones (Jones, 1991; Jones and Swain, 1992) introduced the notion of 'direction' into the competitive anxiety literature. Directional interpretations refers to the extent with which the intensity of the cognitive and perceived physiological symptoms are labeled as either positive or negative to performance on a facilitative-debilitative continuum. To examine the efficacy of directional interpretations within competitive anxiety, Jones and Swain (1992) modified the original CSAI-2 by adding a debilitative-facilitative scale to each item that rated whether the intensity of symptoms experienced were interpreted as facilitative or debilitative towards future performance.

Support for the notion of direction can be found in other areas of psychology (cf. Jones, 1995a). For example, in the test anxiety literature Alpert and Haber (1960) distinguished between debilitating and facilitating anxiety and constructed a scale that measured both dimensions of the response (i.e., the Achievement Anxiety Test; AAT; Alpert and Haber, 1960) and provided a stronger predictor of academic performance than conventional anxiety scales. Other studies have also demonstrated the value of distinguishing between debilitative and facilitative anxiety states (e.g., Carrier, Higson, Klimoski, and Peterson, 1984; Couch, Garber, and Turner, 1983; Gaeddert and Dolphin, 1981).

Initial attempts to explain the notion of direction came from Jones's (1995a) control model of facilitative and debilitative anxiety (see figure 1). Drawing on the work of Carver and Scheier (1986, 1988), the model hypothesized that a combination of individual difference variables and the performers' ability to control a stressor determined how athletes' interpret anxiety associated symptoms (as debilitative or facilitative to performance). Control, conceptualized as the cognitive appraisal of the degree of influence the performer was able to exert over both the environment and the self, was viewed as the central mediating factor. Individuals who appraised that they possessed a degree of control over the situation, were able to cope with their anxiety, and achieve their goals (i.e., coping or positive expectancy of goal achievement) were predicted to interpret symptoms as facilitative to performance. In comparison, performers who appraised that they were not in control, could not cope with the situation at hand, and possessed negative expectancies regarding goal attainment were predicted to interpret such

symptoms as debilitative (Jones, 1995a). Jones (1995a) suggested that direction essentially represented an additional level of cognitive appraisal during which a performer interpreted the meaningfulness of symptoms following an initial or earlier appraisal.

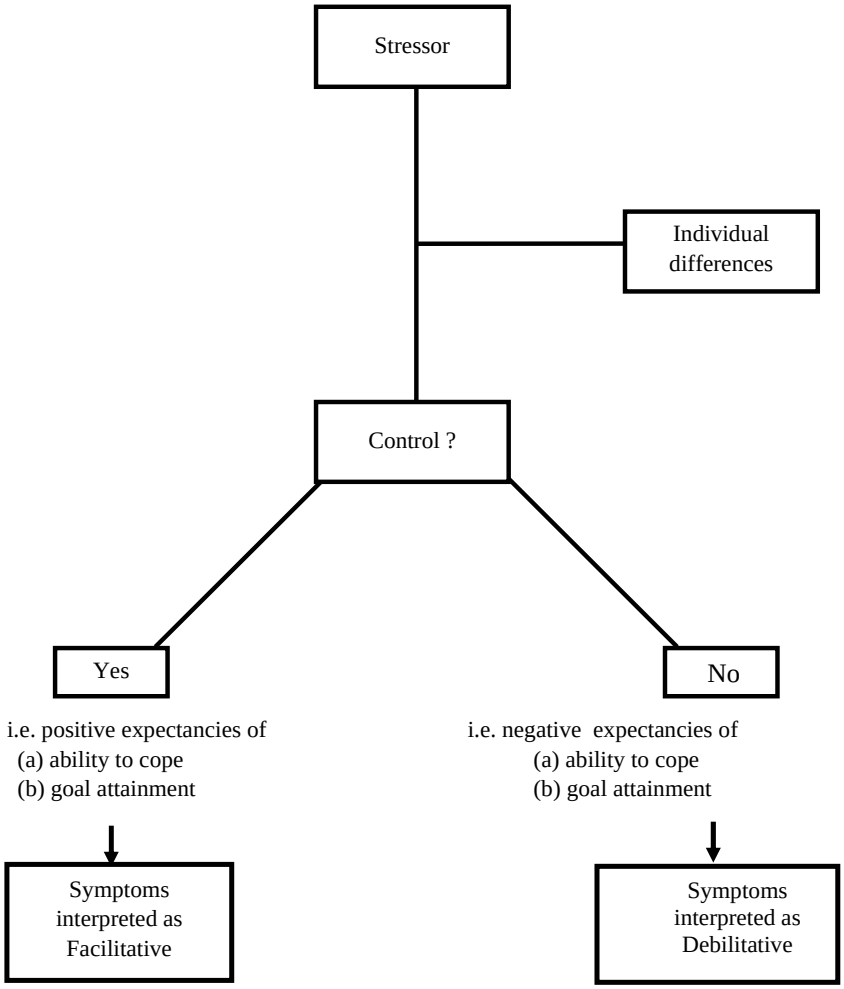

Figure 1: A model of debilitative and facilitative competitive state anxiety (reproduced with permission from Jones, 1995).

Control Processes

Until recently, theorists have failed to explain in any detail the cognitive processes that underlie the control element that leads to symptoms interpreted in a facilitative or debilitative manner. A notable exception can be found in the recent work of Fletcher and Fletcher (2005) and their meta-model of stress, emotion, and performance (see Fletcher et al., this volume). The model divides the stress process into three stages: (1) the person-environment (P-E) fit; (2) the emotion-performance (E-P) fit; and (3) the subsequent coping and overall outcome (COO). The negative consequence of any incongruence in the first stage represents the competitive anxiety response (i.e., psychological strain associated with a negative primary and secondary appraisal of a competitive stressor). It is the second stage of the model, during which tertiary and quaternary appraisal processes occur, that is purported to be analogous with the notion of direction. This stage focuses on the E-P fit which represents an individual's ability to deal with his or her cognitive and somatic reactions to stressors (e.g., the level of competitive anxiety intensity experienced).

Tertiary and Quaternary Appraisal

The second stage of the model is essentially a further aspect of an individual-environment transaction and comprises tertiary (an evaluation whether the emotion experienced is relevant to performance) and quaternary (evaluation of coping options) appraisal processes. These processes contribute to a performer's emotional orientation and whether stress responses are interpreted as facilitative or debilitative to performance. Specifically, in the context of this chapter, how an individual labels anxiety and its associated cognitive and somatic symptoms will subsequently determine the overall nature of his or her preperformance feeling state. According to this conceptualization, a negative emotion such as competitive anxiety may, therefore, precede a positive emotional 'orientation' towards performance.

Similar to the perspective adopted by Jones (1995a) in his model of control, whereby individual differences were hypothesized to influence symptom interpretation, the meta-model (Fletcher and Fletcher, 2005; Fletcher et al., this volume) also predicts that the competitive stress process is moderated by various personal and situational characteristics. The next section reviews the extant research that has investigated the influence of individual difference variables upon performers' interpretations of their anxiety and associated symptoms.

Individual Differences

Since the introduction of Jones's (1995a) model of control the majority of direction studies have focused on examining the individual difference element. A range of personal and situational moderators have been identified and the following section views the relevance of these variables in the interpretation of symptoms associated with competitive anxiety. For convenience, we group the personal factors under the following subsections of trait anxiety, cognitive bias, positive and negative affect, self-confidence, neuroticism and extraversion, hardiness, coping strategies, psychological skills, achievement motivation, competitiveness, and gender. The situational variables are under the subsections of skill level, competitive experience, sport type, cohesion, locus of control, and performance level.

Trait Anxiety

The first personality factor to be considered is competitive trait anxiety. While several studies have examined the potential moderators of the intensity and direction of the competitive trait anxiety response (e.g., Hanton, O'Brien, and Mellalieu, 2003; Jones and Swain, 1995; Perry and Williams, 1998) only one study has considered how competitive trait anxiety may affect subsequent interpretations of state symptoms. Hanton, Mellalieu, and Hall's (2002) comparison of high and low trait anxiety in soccer players found that the high trait group responded with significantly greater state intensity than the low trait group. With regard to direction, however, no differences were found in the interpretation of cognitive and somatic symptoms between high and low trait anxiety groups. The preliminary findings regarding symptom intensity support Martens, Burton et al.'s (1990) premise that highly trait anxious performers will generally respond to stressful situations by demonstrating high levels of state anxiety. However, more research is needed to examine the role of trait anxiety and symptom interpretation.

Cognitive Bias

One explanation for the moderating effects of trait anxiety upon symptom interpretation is through the cognitive bias of an individual. This notion is based upon Beck's (1976) theoretical account of emotional vulnerability that suggests individuals who are vulnerable to anxiety exhibit a cognitive processing bias for

the threatening interpretation of ambiguous information. In a series of investigations Eubank and colleagues (Eubank, Collins, and Smith, 2000, 2002) found that anxiety debilitators showed a processing bias for threatening information, while anxiety facilitators were biased toward emotionally positive stimuli. Eubank et al. explained these findings by suggesting that although facilitators of anxiety symptoms are sensitive to positive interpretations of ambiguous stimuli they may be able to keep negative affect under control by an effortful avoidance of threat, which could be viewed as an effective strategy for coping with stress.

In a related study Jones, Smith, and Holmes (2004) investigated the bias in the processing of anxiety related stimuli and differences in symptom interpretation due to the cognitive defense mechanism characteristic of different personality types (high-anxious, low-anxious, repressor and defensive high-anxious) which served to either magnify or minimize the threat experienced (cf. Eysenck, 1997). Jones et al. (2004) hypothesized that the tendency to report symptoms as facilitative to performance would be characteristic of repressors (i.e., individuals who report low anxiety levels as they genuinely believe they are not experiencing negative affect) rather than high-anxious and low-anxious individuals. While repressors and low-anxious individuals reported lower levels of anxiety intensity than the high-anxious group the repressors also reported their symptoms experienced as more facilitative to performance than the high-anxious individuals. Jones et al.'s findings suggest, therefore, that the cognitive biases of repressors may serve to reduce the intensity of anxiety experienced rather than influence the directional interpretation of symptoms.

Positive and Negative Affect

Positive and negative affect are two relatively independent personality variables that have been identified in social psychological studies of affective structure and have been described as an individual's tendency to display adaptive or aversive mood states (e.g., Watson and Clark, 1984; Watson and Tellegen, 1985). Positive affect reflects the extent to which a person feels enthusiastic, active or alert, with high positive affect characterized by moods associated with full concentration, eagerness and pleasurable engagement. Negative affect is viewed as a general dimension of subjective distress, with high negative affect reflected by unpleasant mood states, including anger, contempt, fear and nervousness. Jones et al. (1994) suggested that a performer's affective state may influence, or in someway be related to his or her interpretation of anxiety

symptoms. Subsequently, Jones, Swain, and Harwood (1996) found that negative affect was related to the intensity of cognitive and somatic anxiety responses while positive affect had a greater significant correlation than negative affect in the interpretation of both cognitive and somatic anxiety symptoms. Similar findings were also noted by Cerin (2004) with positive affect significantly predicting cognitive and somatic anxiety direction. Finally, in a follow-up to Jones et al.'s (1996) study, Hanton and Mellalieu (in press) compared facilitators and debilitators of symptoms associated with competitive anxiety with positive affect and negative affect respectively, and found that debilitators experienced lower positive affect and greater negative affect than their facilitating counterparts.

Collectively, these findings suggest that performers' symptoms interpretation may be predicted by positive and negative affect (Jones et al., 1994). Specifically, high negative affect individuals appear to consistently perceive symptoms as debilitative, while performers high on positive affect tend to interpret their symptoms as more facilitative. Negative affect therefore reflects a relatively stable disposition to experience negative emotional states, or a 'vulnerability factor', while high positive affect may be viewed as a 'resiliency factor' characterized by high levels of self-esteem and self-confidence. Interestingly, in Hanton and Mellalieu's (in press) study, facilitators of symptoms associated with competitive anxiety also experienced greater levels of self-confidence than debilitators, a finding that appears to be consistent across other direction studies (e.g., Jones et al., 1994; Jones and Swain, 1995; Perry and Williams, 1998).

Self-confidence

One of the most robust findings to emerge from the direction literature is that facilitators of symptoms associated with competitive anxiety report greater levels of self-confidence than their debilitating counterparts (e.g., Hanton and Jones, 1997; Hanton, Jones, and Mullen, 2000; Jones et al., 1994; Jones and Swain, 1995; Perry and Williams, 1998). High correlations have also been reported between the self-confidence and the direction subscales of the CSAI-2 (Jones et al., 1993, 1996). Self-confidence has subsequently been suggested in some way to act as a resiliency factor and protect against the debilitating effects of anxiety (Hardy et al., 1996; Mellalieu, Neil, and Hanton, in press). In order to explore the nature of this relationship Hanton, Mellalieu, and Hall (2004) conducted interviews with elite performers regarding their experiences of precompetitive symptoms. Increases in cognitive symptoms accompanied by low self-confidence

were perceived as outside of the performers' control and debilitating to performance, while the presence of high self-confidence and cognitive symptoms led to positive perceptions of control and facilitating interpretations.

Although Hanton, Mellalieu et al.'s (2004) findings suggest self-confidence influences symptom interpretation, the qualitative nature of their design prevented any inferences being made regarding specific mediating or moderating effects. It is apparent, however, that above all other individual difference variables self-confidence may be the most significant factor in discriminating how athletes manage and interpret stressful situations (Hardy et al., 1996).

Neuroticism and Extraversion

Neuroticism is a personality trait that is characterized by the tendency to experience negative affect, while extraversion is associated with the predisposition to experience positive affect. Cerin (2004) has recently considered the influence of neuroticism and extraversion upon anxiety intensity and symptom interpretation. Significant interactions were identified for neuroticism and negative affect upon cognitive anxiety direction, and neuroticism and somatic anxiety intensity upon somatic anxiety direction. For extraversion, a positive relationship was identified with cognitive anxiety direction and a negative one with cognitive anxiety intensity. In addition, individuals who were higher in extraversion interpreted their symptoms as more facilitative to performance than the lower extraversion individuals. Cerin noted that as neurotics tend to be more negativistic and ruminative than non-neurotics it is possible that the accentuated self-awareness may make them more distractible and vulnerable to fluctuations in body sensations and negative cognitions. Subsequently, this negativistic attitude may contribute to a more negative appraisal of the influence of symptoms upon performance. For extraverts, their higher levels of optimum stimulation, sensation seeking, assertiveness, and tendency to experience positive emotions may lead to them reacting to events in a more positive manner than that of non-extraverts. They may also perceive the same symptoms as more facilitative to performance than non-extroverts because of their tendency to be optimistic and behave proactively when confronted with problematic or threatening situations (cf. Cerin, 2004).

Hardiness

Hardiness refers to an individuals' ability to remain healthy in the face of stressful life events and comprises the three elements of commitment, control, and challenge (Kobasa, 1979). Although the positive effects of a 'hardy' personality (such as reduced life stress) have been demonstrated in clinical psychology only Hanton, Evans, and Neil (2003) have studied the relationship with competitive anxiety symptoms. In an examination of the effects of skill level and hardiness upon trait anxiety responses, elite athletes high in hardiness reported lower competitive anxiety levels, more facilitative interpretations of these symptoms and higher self-confidence levels when compared to their nonelite counterparts. These findings suggest that a hardy personality moderates how competitive anxiety is interpreted by performers. A possible mechanism for this influence may be the hardy performer's ability to transform the appraisal of a stressor in a more positive fashion (cf. Hanton, Evans, et al., 2003).

Coping Strategies

Studies investigating the relationship between coping and competitive anxiety direction have examined the specific strategies employed by performers with either facilitating or debilitating interpretations of symptoms (Eubank and Collins, 2000; Jerome and Williams, 2000; Ntoumanis and Biddle, 2000). For example, Ntoumanis and Biddle (2000) found that facilitating interpretations of competitive anxiety symptoms were related to increased effort, suppression of competing activities, and problem-focused coping including positive emotional and motivational outcomes. Debilitating perceptions of symptoms were associated with behavioral disengagement and an inability to regulate emotions. Jerome and Williams (2000), and Eubank and Collins (2000), have also found that facilitators used more problem- and emotion-focused coping strategies in response to stress; whereas, debilitators were limited in their use of coping constructs. These findings support Jones's (1995a) proposal that coping is a key construct in the control individuals have over themselves and their environment. Moreover, facilitating interpretations of symptoms appears to be a representation that effective coping is taking place (Eubank and Collins, 2000).

Psychological Skills

A number of studies have investigated the relationship between psychological skills and competitive anxiety. For example, Fletcher and Hanton (2001) examined the intensity and direction of competitive state anxiety as a function of 'high' and 'low' psychological skill usage in nonelite swimmers. Findings showed that performers who reported greater use of relaxation strategies experienced lower levels of anxiety and interpreted symptoms as more facilitative to performance than their low usage counterparts. Similar results were found by Maynard and colleagues who employed an intervention approach with nonelite soccer players (Maynard, Hemmings, and Warwick-Evans, 1995; Maynard, Smith, and Warwick-Evans, 1995). The relaxation strategy adopted was found to reduce the intensity of anxiety symptoms and increase facilitative interpretations of symptoms and levels of self-confidence. Other investigations that have adopted the use of psychological skill-based interventions, such as mental imagery, have also reported increases in facilitative interpretations of symptoms (e.g., Hale and Whitehouse, 1998; Page, Sime, and Nordell, 1999).

A final line of inquiry has been to examine the effects of multimodal psychological skill packages upon symptom interpretation. Hanton and Jones's (1999b) multiple baseline design used a combined goal setting, imagery, and self-talk package with elite swimmers who were debilitated by cognitive and somatic symptoms. No changes were reported in the intensity of symptoms but increases occurred in facilitative interpretations, self-confidence and performance. Using a similar mental skill package combination to Hanton and Jones, Mamassis and Doganis (2004) also showed increases in facilitating interpretations of symptoms, self-confidence and performance in an experimental versus control group of junior tennis players.

Taken together the studies that have considered the influence of psychological skills upon symptom interpretation suggest that nonelite athletes use primarily relaxation strategies to reduce and interpret anxiety intensity levels as facilitative, relying minimally on other psychological skills. In contrast, elite athletes appear to maintain their intensity levels and use a combination of psychological skills, including goal setting, imagery, and self-talk strategies to restructure the interpretation of their symptoms as facilitative (Hanton and Jones, 1999a).

Achievement Motivation

Despite the wealth of investigations that have examined the relationships between motivational constructs, such as achievement goal orientation, and the subsequent affective responses (see Kingston, Spray, and Harwood, this volume) only Ntoumanis and Biddle (1998) have considered the relationship with anxiety symptom interpretation. In their study, Ntoumanis and Biddle examined achievement goal orientations, perceived motivational climate, and perceptions of the intensity and direction of competitive state anxiety. While no significant relationships were found between task orientation and direction, the effect of ego orientation on the intensity and direction of cognitive and somatic anxiety was reported to be exerted through self-confidence. In addition, no significant relationships were found between motivational climates and competitive anxiety intensity and direction. These findings suggest that motivational climates may have an indirect impact on affective responses through the different goal orientations, while self-confidence again appears to be a powerful construct in helping performers cope with the debilitating effects of stress.

Competitiveness

A further motivational construct that has been examined in relation to anxiety interpretation is the competitive orientation or competitiveness of the performer. Here competitiveness refers to the desire to enter and strive for success in sporting competition (Gill and Deeter, 1988). In the first empirical study of direction, Jones and Swain (1992) compared intramural athletes with high and low competitive orientations. No differences in the intensity of the cognitive and somatic symptoms were reported, or in the somatic symptom interpretation. However, the higher competitive group rated cognitive anxiety symptoms as more facilitative to performance than the less competitive group.

Gender

Investigations that have examined the effects of gender upon the intensity of the competitive anxiety response have generally found that females report higher levels of competitive state and trait anxiety than males (e.g., Jones and Cale, 1989; Martens, Burton, et al., 1990). However, only Perry and Williams (1998) have directly examined gender differences in symptom interpretation. In their

comparison of advanced, intermediate and novice male and female tennis players the authors reported no differences in cognitive or somatic anxiety intensity. Overall, though, males did report more facilitative interpretations of their cognitive and somatic responses when compared to their female counterparts. Perry and Williams's findings suggest that male athletes may vary in their use of cognitive processes for dealing with their respective precompetitive experiences. One explanation for these differences could be due to the fact males also reported greater levels of self-confidence than females which may in some way have helped them to protect against debilitating symptom interpretations (cf. Hardy et al., 1996). Alternatively, it has been suggested that females possess more willingness to report their feelings than males, particularly those of an unpleasant nature (cf. Jones, 1990). Females may therefore be more likely to present a more accurate reflection of their symptoms as they feel a greater social acceptability of reporting anxiety.

Skill Level

Skill level is one of the original and most frequently studied situation variables and considers how elite and nonelite individuals may differ in their symptom interpretation (Eubank, Collins, and Smethhurst, 1995; Jones et al., 1994; Jones and Swain, 1995). One of the first studies conducted was by Jones et al. (1994) who reported no differences in the intensity of cognitive and somatic state anxiety of elite and nonelite swimmers, but found that the elite swimmers interpreted their symptoms as more facilitative to performance than their nonelite counterparts. Similar findings have also been observed by Jones and Swain (1995) and Eubank et al. (1995) in the sports of cricket and badminton respectively. A further degree of skill level evaluation was adopted by Perry and Williams (1998) who compared the intensity and direction of competitive trait anxiety responses of advanced, intermediate and novice tennis players. While no differences were observed between groups for somatic anxiety intensity the novice group reported lower cognitive anxiety intensity. For direction, only advanced players reported more facilitative interpretations of cognitive and somatic symptoms than their novice and intermediate counterparts, providing partial support for the previous studies.

These and other recent findings regarding skill level (e.g., Hanton, Evans, et al., 2003; Hanton and Connaughton, 2002) suggest that elite performers do not differ from their nonelite counterparts in terms of the intensity of precompetitive anxiety responses experienced. It does appear, however, that elite individuals

typically have a more positive interpretation of these symptoms in terms of their consequences for performance.

Competitive Experience

Whereas skill can be viewed as an objective individual ability and performance (Martens, Vealey, et al., 1990) at a particular sporting level (e.g., national, international), the concept of competitive experience is associated with the familiarity of the competitive environment (Cerin et al., 2000). In their qualitative investigation of elite swimmers' preparation for competition, Hanton and Jones (1999a) noted that the acquisition of mental skills was a gradual progression over the athletes' careers with initial experiences of cognitive and somatic symptoms associated with competitive anxiety viewed invariably as debilitating to performance. Later, however, the development of cognitive skills and strategies underlying the facilitative interpretation of symptoms were reported to be acquired via natural learning experiences and various educational methods. Mellalieu et al. (2004) also considered the notion of competitive experience while investigating the intensity and direction of symptoms associated with anxiety as a function of the activities of a gross explosive (rugby) and fine motor-skilled (golf) nature. In both sports the experienced performers reported lower intensity and more facilitative interpretations of symptoms than their less experienced counterparts.

The observations of Hanton and Jones (1999a) and Mellalieu et al. (2004) suggest that the level of competitive experience might be a more sensitive indicator of psychological skill development than solely the achievement of elite status (i.e., skill level). In addition, although higher skilled performers are generally assumed to possess greater competitive experience it may be possible for an athlete to be categorized as highly skilled yet be very low in experience due to a sudden rise in performance level. From a psychological development perspective, such an increase in performance may be premature for the athlete if important competitive experiences are absent.

Sport Type

A further situation variable that has been suggested to moderate anxiety direction is the nature of the sport (Jones, 1995a; Jones et al., 1994). Differences in interpretation have been compared as a function of activities that vary in terms

of fine and gross motor skill requirements (e.g., Hanton, Jones, and Mullen, 2000; Mellalieu et al., 2004). Collectively, the findings suggest that while no differences exist in the intensity of competitive anxiety symptoms, athletes who participate in relatively explosive motor skilled sports (e.g., rugby union) report their competitive anxiety states as more facilitative to performance than participants from sports of finely controlled skills such as pistol shooting and golf. These findings clearly highlight the necessity to consider each sport separately when evaluating the appropriate psychological preparation required for competition.

Cohesion

As well as the study of individual variables, the impact of group moderators upon anxiety symptom interpretation has also been examined. Specifically, Eys, Hardy, Carron, and Beauchamp (2003) compared the relationship between task cohesion and the intensity and direction of competitive anxiety symptoms. Athletes who perceived their cognitive anxiety symptoms as facilitative reported greater perceptions of task-related attraction to the group (ATG-T) and task group-integration (GI-T) than athletes who perceived their cognitive anxiety symptoms as debilitative. In addition, athletes who perceived their somatic anxiety symptoms as facilitative also reported higher perceptions of GI-T. Although preliminary in nature, these findings suggest that highly cohesive teams are likely to experience competitive state anxiety differently than members of less cohesive teams. Furthermore, perceptions of task cohesion appear to be related to individuals' symptom interpretation. This highlights that improvements or changes in the dynamics of the team may therefore enhance the psychological state of the individual.

Control

The ability to control a stressor is pivotal in determining how athletes' interpret anxiety symptoms as debilitative or facilitative to performance (Jones, 1995a). Support has been found in several studies that have measured control both indirectly, by using performers' goal attainment expectations (e.g., Hanton, O'Brien, et al., 2003; Jones and Hanton, 1996; O'Brien, Hanton, and Mellalieu, 2005), and directly (Ntoumanis and Jones, 1998) through measures such as the Internal-External Locus of Control Scale (I-E scale; Rotter, 1966). For example, Jones and Hanton (1996) and Hanton, O'Brien et al. (2003) found that individuals

with positive expectancies of goal attainment reported their symptoms as more facilitative to performance than those with negative expectations, who were debilitative. Ntoumanis and Jones's (1998) comparison of symptom interpretation in internal and external locus of control groups found that those athletes with an internal locus of control perceived the intensity of their trait anxiety symptoms as more facilitative to performance than those who viewed themselves as having an external locus of control.

While these studies provide some support for Jones's (1995a) model the cross-sectional nature of the designs employed means that no firm conclusion can be drawn about the moderating or mediating effects of perceptions of control. Interestingly, several recent qualitative investigations of the precompetitive stress experience have provided some descriptive explication regarding this issue and the mechanisms underlying directional interpretations. Specifically, anxiety responses perceived to be under the performers' control have been reported as having facilitative consequences for performance while symptoms outside of control have been viewed as debilitative (Hanton and Connaughton, 2002, Hanton, Mellalieu, et al., 2004).

Performance Level

Despite the apparent significance of the relationship between precompetitive symptom interpretation and subsequent performance only a few studies have directly investigated this association. One of the first was Jones, Swain, and Hardy's (1993) comparison of club-level gymnasts who were divided into good and poor performance groups based on their beam competition scores. While no significant differences emerged in the intensity of responses, the more successful gymnasts were found to experience greater facilitative interpretations of their cognitive and somatic anxiety symptoms than their less successful counterparts.

Other studies have attempted to explain the relationship between symptom interpretation and performance by assessing the amount of performance variance accounted for by the direction subscale of the CSAI-2 (Edwards and Hardy, 1996; Jerome and Williams, 2000; Swain and Jones, 1996) For example, Swain and Jones (1996) indicated that the direction dimensions predicted more variance in basketball performance than the intensity dimension alone, while the addition of the direction scales increased the amount of performance variance explained on top of that predicted by the intensity scales (Swain and Jones, 1996). In contrast, Edwards and Hardy (1996) reported that both direction subscales failed to explain any variance in netball performance, while Jerome and Williams's (2000)

investigation of recreational and semi-professional bowlers revealed that the only significant predictor of performance was somatic anxiety direction.

One reason for the equivocal findings may be that previous studies have only assessed anxiety symptoms preperformance rather than during competition. In an attempt to compare pre and in-event measures, Butt, Weinberg, and Horn (2003) found that cognitive and somatic anxiety direction and self-confidence intensity and direction predicted a significant amount of performance variance for the 1st and 2nd halves of field hockey matches respectively. Further, the results also indicated that the anxiety and self-confidence measurements obtained during competition were more strongly related to performance than the pre-game measures.

Collectively, the studies investigating Jones's (1995a) control model suggest consistent trends between groups of individuals in relation to anxiety interpretation. Specifically, a broad range of personal and situation variables moderate performers' symptom interpretations. Findings also support the value of distinguishing between the intensity and the direction of symptoms experienced in competitive situations. Further, direction may actually be a more sensitive variable in distinguishing between group differences when compared solely with the intensity of the response (Hanton, Cropley, Mellalieu, Neil, and Miles, in press; Jones and Hanton, 2001; Mellalieu, Hanton, and Jones, 2003; Swain and Jones, 1996).

TEMPORAL PATTERNING

In addition to the consideration of other dimensions of the competitive anxiety response, such as frequency and direction, researchers have highlighted the importance of adopting a process orientated approach that emphasizes the study of stress longitudinally over time (Cerin et al., 2000; Cerin, Szabo, and Williams, 2001; Hanton, Thomas, and Maynard, 2004; Lazarus, 1999). As discussed earlier in the frequency of cognitive intrusions section, a wealth of literature exists examining the intensity of the competitive anxiety responses in the lead up to competition. Using a time to event paradigm general support has been found for Martens, Vealey et al.'s (1990) predictions that cognitive anxiety and self-confidence remain unchanged in the lead up to competition while somatic anxiety increases and peaks directly prior to performance. The temporal nature of the intensity of the response has also been shown to be moderated by several situation and individual difference factors (see Cerin et al., 2000). Until recently limited attention had been given to assessing how the different dimensions of anxiety unfold over time. This section therefore considers how researchers have

taken the study of the temporal nature of competitive stress over time further by exploring the complexities of all three anxiety dimensions.

The first study to combine the assessment of more than one dimension using the time to event paradigm was Wiggins's (1998) examination of the intensity and direction of the anxiety response in the period 24 hours prior to competition. Significant increases over time were reported for somatic anxiety intensity, decreases for self-confidence, and no changes for cognitive anxiety intensity or anxiety interpretation. This latter finding led Wiggins to conclude that once athletes had interpreted their symptoms associated with competitive anxiety as either facilitative or debilitative towards performance this interpretation did not change. Similar findings were reported by Butt et al. (2003) in their examination of the fluctuations in intensity and direction throughout competition (directly prior to competition, first half, second half, directly postcompetition) using retrospective recall measures. Butt et al. found that the only significant changes from pre to postcompetition occurred in cognitive anxiety intensity and self-confidence, while during performance, self-confidence and the intensity and direction of cognitive and somatic anxiety were reported to remain relatively stable.

Recent research by Hanton and colleagues has combined the study of the intensity, frequency and direction dimensions of the anxiety response (e.g., Hanton et al., 2002; Hanton, Thomas, et al., 2004; Thomas, Maynard, and Hanton, 2004). The first of these was Hanton et al.'s (2002) qualitative investigation of elite performers' retrospective perceptions and causal beliefs regarding temporal experiences of competitive anxiety and related symptoms in the lead up to competition. While theoretical predictions were supported for the intensity and frequency of the temporal patterning of anxiety, in contrast to Wiggins (1998) and Butt et al. (2003), interpretations of symptoms were reported to change as the competition approached. Specifically, cognitive and somatic symptoms were interpreted as facilitative during the preparation phase for competition, but debilitative directly before performance. Hanton et al. suggested this finding was potentially due to the athletes experiencing forms of both preparatory and performance anxiety (cf. Burton, 1998; Mellalieu et al., 2003).

The next investigation of all three anxiety dimensions was an empirical study by Hanton, Thomas et al. (2004) who examined the temporal patterns of symptoms in a 7 day precompetition phase (7 days, 48 hours, 24 hours, 2 hours, 30 minutes) as a function of skill level (elite versus nonelite). Differences were found only in the direction dimension with elite performers' more facilitative in their interpretation of cognitive and somatic symptoms through the week preceding competition. For both groups, greater temporal changes were noted in

the frequency of responses in the time leading up to the event. In an attempt to further discriminate changes in symptoms as a function of anxiety interpretation Thomas et al. (2004) examined competitive state anxiety responses in the lead up to competition across the three dimensions in performers with varying symptom interpretations (i.e., 'facilitators', 'debilitators' and 'mixed interpreters'). Facilitators displayed increased intensities of self-confidence, more positive interpretations of cognitive and somatic symptoms, increased frequency of self-confidence symptoms and decreased frequency of cognitive anxiety symptoms than debilitators and mixed interpreters throughout the precompetition period. Time-to-competition effects also indicated that directional interpretations of cognitive and somatic responses became less positive close to competition and the frequency of cognitive and somatic symptoms increased towards the event. Taken collectively, Thomas et al.'s results appear to suggest therefore that debilitators differ in their symptom responses when compared to facilitators (i.e., intensity and frequency). Not only do debilitators view anxiety symptoms as negative towards performance, they also think about these symptoms more often preceding competition. In addition, they experience lower levels of self-confidence and think about these symptoms less often as competition moves closer.

To accompany the study of the temporal patterning of anxiety symptoms experienced across the competition period researchers have developed abbreviated scales that allow faster assessment of responses. These include the Mental Readiness Form (MRF; Murphy, Greenspan, Jowdy, and Tammen, 1989), the Anxiety Rating Scale-Cognitive (ARS-C) and Somatic (ARS-S) instruments (Cox, Russell, and Robb, 1998, 1999), and Immediate Anxiety Measurement Scale (IAMS; Thomas, Hanton, and Jones, 2002). While some investigators have questioned the psychometric properties of short form scales (e.g., Edwards and Hardy, 1995; Hardy, 1996) there appears to be consistent support for the adoption of abbreviated scales where time may be limited and preclude the use of full length instruments (e.g., Butt et al., 2003; Cox et al., 1999; Krane, 1994; Krane, Joyce, and Rafeld, 1994; Thomas et al., 2002).

KEY ISSUES

The recent emphasis towards the study of the positive effects of the anxiety response, and in particular the notion of facilitating interpretations of symptoms associated with anxiety, has stimulated considerable discussion among sport psychology researchers (e.g., Burton, 1998; Burton and Naylor, 1997; Hardy, 1997, 1998; Jones, 1995a; Jones and Hanton, 2001; Mellalieu et al., 2003). Within

the discourse three main themes have emerged that relate to measurement, rhetorical and theoretical issues.

Measurement

The first measurement issue relates to the utility of the modified CSAI-2 to accurately assess direction (Burton, 1998; Burton and Naylor, 1997). Burton suggested that the modified CSAI-2 creates a measurement confound because individuals rate the facilitative or debilitative nature of their perceived anxiety symptoms in a constant fashion despite experiencing variable levels of anxiety intensity. Specifically, different individuals may experience a wide range of intensity levels yet may rate these levels to be equally facilitating or debilitating to forthcoming performance. Similarly, one performer may experience a small number of symptoms at an intense level while another may experience a large number of symptoms at a lesser level of intensity, both which may be perceived as equally facilitating or debilitating to performance. Clearly such cases represent different cognitive and somatic symptoms experienced yet both will have similar scores as assessed by the modified CSAI-2.

The next measurement issue lies in the ambiguous wording of several items of the CSAI-2 (Burton, 1998; Lane, Sewell, Terry, Bartram, and Nesti, 1999; Woodman and Hardy, 2001). Woodman and Hardy (2001) noted that the use of the term “concern” in the item wording of the cognitive anxiety scale is not necessarily a reflection of worry or cognitive anxiety, but rather a perception of the importance of the upcoming event. This point is emphasized by Cerin (2003), who suggested that the cognitive subscale of the CSAI-2 may be confounding threat and challenge related appraisals (e.g., fear and worry versus excitement, interest or eagerness). Further support for the concerns regarding the ambiguous wording of items has come from studies examining of the factor structure of the CSAI-2 intensity subscales (e.g., Cox, Martens, and Russell, 2003; Iosifidou and Doganis, 2001; Tsorbatzoudis, Barkoukis, Sideridis, and Grouios, 1998), the comparison of the CSAI-2 with other affective measures (Cerin, 2003, 2004) and the completion of the scale in response to excited and anxious scenarios (Jones and Uphill, 2004).

Woodman and Hardy (2001) also pointed out that some of the items originally selected for the CSAI-2 might not reflect the most salient aspects of precompetitive anxiety for some athletes. Indeed, the CSAI-2 and self-report measures in general can only assess the perceived cognitive and somatic symptoms that are *commonly associated* with the competitive anxiety response by

certain but not all individuals. Consequently, while one athlete may view items such as “my heart is racing” as reflecting somatic symptoms of anxiety, another may view “I feel jittery” as irrelevant. Despite these measurement issues Woodman and Hardy (2001, p. 302) noted “…the CSAI-2 has been, and continues to be, the choice of predilection for most researchers with an interest in competitive state anxiety.”

Rhetorical

One issue that has received little attention within this area relates to the rhetoric used by researchers. Historically, there has been inconsistency with the use of terms (cf. Burton, 1998; Burton and Naylor, 1997; Hardy, 1998; Jones, 1995a). Burton (1990), for example, noted that anxiety states could be ‘positive’ and helpful in facilitating mental preparation and performance, while Parfitt et al. (1990) suggested that positive performance effects could be associated with cognitive and somatic anxiety. Parfitt et al. also discussed the notion that some performers may ‘perceive’ or label symptoms as facilitating to performance. Later, Jones (1995a) used the term ‘facilitative anxiety states’ to refer to how performers labeled their cognitive and physiological symptoms in a positive manner in relation to performance. He also noted, however, that a state in which symptoms were perceived as facilitating to performance was unlikely to represent a state of anxiety.

Hardy (1997) also highlighted that athletes may interpret their symptoms as facilitative to performance and that anxiety could, under certain circumstances, enhance performance. In response, Burton and Naylor (1997) argued against Hardy’s assertion that anxiety can be facilitative to performance. In a subsequent rebuttal, Hardy (1998) called for a reconceptualization of the competitive anxiety construct, but also maintained his position that anxiety may result in improvements in performance.

These issues emphasize the importance of rhetoric in the competitive anxiety literature and highlight three main areas: 1) the notion of ‘positive anxiety’ or ‘facilitative anxiety’, 2) facilitative interpretations of competitive anxiety, and 3) the positive effects of anxiety on performance. It is important, therefore, to clarify the rhetoric in order that researchers can examine the different relationships that explain the positive consequences of anxiety states upon performance. We suggest that the terms ‘positive anxiety’ and ‘facilitative anxiety’ are oxymorons best avoided as they suggest anxiety is a positive emotion. We recommend that ‘facilitative interpretations of symptoms associated with competitive anxiety’ is

more appropriate and, importantly, accurate. This term refers to a specific negative emotion and associated symptoms which are appraised by the individual as having a beneficial influence on performance (Jones, 1995a). It is also important to distinguish this term from anxiety as a negative emotion actually having a positive effect upon performance or the positive effect of anxiety on performance. This refers to a specific negative emotion which has been deemed to have a beneficial influence on performance – regardless of whether the individual appraises the emotion as facilitative or debilitative (Hardy, 1997, 1998; Parfitt et al., 1990).

Theoretical

Following on from the rhetorical issues, three main theoretical issues emerge. First, regarding the oxymoron of positive or facilitative anxiety, Burton (Burton and Naylor, 1997; Burton, 1998) suggested that the direction approach confounded the labeling of anxiety with other more positive emotions which had simply been mislabeled as facilitative anxiety. However, Jones (1995a) discussed the notion of facilitative anxiety 'states', rather than that of facilitative anxiety *per se*, whereby the overall affective state experienced was deemed as facilitating to performance rather than anxiety itself being a positive emotion.

From this theoretical issue emerged the importance of considering the labeling of thoughts and feelings in understanding performers' positive and negative precompetitive states. Consequently, the second theoretical issue regards the contention that the positive effects of anxiety occur through performers' facilitative interpretations of competitive anxiety and its associated symptoms (Jones and Hanton, 2001). Evidence to explain this view can be found in a series of recent studies conducted to compare the type and content of the precompetitive affective response experienced (i.e., positive or negative) of facilitators and debilitators of symptoms associated with competitive anxiety (Hanton and Mellalieu, in press; Jones and Hanton, 2001; Mellalieu et al., 2003). Performers who identified symptoms on the CSAI-2 as facilitative to performance reported greater positive and lower negative affective responses. Conversely, debilitators of symptoms associated with competitive anxiety indicated significantly higher scores on negative and lower scores on positive affective responses. Facilitators also reported greater perceptions of mental readiness, self-confidence and positive perceptions of physical state, while content analysis of the responses experienced by performers revealed that 90% of the feelings experience were perceived as

positive for performance by facilitators, compared with a mere 30% of labels for debilitators (Mellalieu et al., 2003).

These findings suggest that the way performers interpret competitive anxiety will influence the 'orientation' (Fletcher and Fletcher, 2005) of their overall affective state. This perspective differs subtlety from Burton's (Burton, 1998; Burton and Naylor, 1997) and Jones's (1995a) views because it indicates that rather than anxiety being confounded with positive emotions, performers can experience competitive anxiety symptoms while experiencing positive feeling states. One explanation for this notion can be found in Fletcher and Fletcher's (2005, Fletcher et al., this volume) meta-model of stress, emotions and performance. Performers may experience competitive anxiety as an initial consequence of primary and secondary appraisal of a stressor. However, following further tertiary and quaternary appraisal, this response may be interpreted as necessary and/or facilitative to performance, leading to the generation of a positive feeling state (e.g., excitement). This cognitive process accounts for findings that have shown performers can experience ambivalent affect in the precompetitive period (Cerin, 2004; Hanton and Mellalieu, in press, Jones and Hanton, 2001; Mellalieu et al., 2003). It also appears to explain how traditional anxiety inventories, such as the CSAI-2, can easily confound a negative emotion with positive feeling states (cf. Burton and Naylor, 1997; Burton, 1998).

The final theoretical contention addresses whether anxiety can actually have a positive effect (i.e., outcome) on performance. In citing Lazarus' (1991) model of emotion, Burton (Burton and Naylor, 1997; Burton, 1998) suggested that negative emotions would always have a negative affect on performance and positive emotions a beneficial effect (cf. Martens, Burton, et al., 1990). In response, researchers have argued that negative emotions, such as anxiety, can have a positive effect upon performance (Hardy, 1997, 1998; Woodman and Hardy, 2001). Hardy (1997, 1998) has explained these direct effects through various anxiety-performance approaches including processing efficiency theory (Eysenck and Calvo, 1992) and catastrophe models (Hardy, 1990). In processing efficiency theory the presence of anxiety symptoms signals to the performer the importance of the upcoming event, and the need to muster all available resources in order to perform the necessary actions on the field (Hardy, 1997). In catastrophe models, under low levels of physiological arousal, rises in the intensity of cognitive anxiety symptoms may lead to enhanced performance (Hardy and Parfitt, 1991). The descriptions of such positive consequences of anxiety will be discussed in greater detail in the next section that considers the various explanations for the anxiety-performance relationship.

Chapter 5

THE ANXIETY-PERFORMANCE RELATIONSHIP

A key issue pervading the literature that is of central concern to sport psychology researchers and practitioners alike is the relationship between anxiety and performance. This section discusses some of the theories and models that allude to the potential positive consequences of this relationship. These include arousal-based explanations, the zone of optimal functioning hypotheses, multidimensional anxiety theory, catastrophe models and processing efficiency theory. Further detailed description of these and additional anxiety-performance approaches can be found in other reviews of the topic (e.g., Burton, 1998; Gill, 1994; Jones, 1995a; Raglin, 1992; Woodman and Hardy, 2001).

AROUSAL-BASED APPROACHES

Initial inquiries attempted to determine the anxiety-performance relationship through arousal-based explanations. For example, drive theory (Spence and Spence, 1966) purported that an increase in drive or arousal was associated with a linear increase in performance providing that the learned dominant response was one of a correct skill execution. This approach was superceded in sport psychology by the inverted-U hypothesis (Oxendine, 1970) that described the relationship between arousal and performance through an inverted-U (see Anshel, 1990; Landers and Arent, 2001). Increases in arousal up to an 'optimal' level were suggested to result in positive performance gains, beyond which performance decrements occurred. Optimal levels of arousal were also suggested to be dependent on the type of task, with more complex tasks requiring lower arousal levels for optimal performance (cf. Landers and Arent, 2001). Despite their

intuitive appeal, however, drive theory and the inverted-U hypothesis have been criticized for their simplistic nature and a failure to explain how arousal affects performance (Gill, 1994; Hardy, 1990; Hardy et al., 1996; Krane, 1992; Neiss, 1988).

A recent approach that accounts for the positive aspects of the arousal-performance relationship is that of reversal theory (Kerr, 1993). Based upon the work of Apter (1982, 1984), the theory suggests that motivation is influenced by changes or reversals between four paired alternate meta-motivational states. In a telic state, high physiological arousal will be interpreted as anxiety; whereas in a paratelic state, high physiological arousal will be experienced as excitement. Equilibrium in the desired meta-motivational state is achieved when minimal differences arise between an individual's preferred and actual arousal state. In addition, contingent upon the perceived pleasure or hedonic tone of the individual, performers can also suddenly reverse from the experience of high arousal as excitement to one of anxiety (Kerr, 1997). Unlike the inverted-U hypothesis, high levels of physiological or felt arousal may not automatically lead to detrimental performance consequences and may actually be beneficial.

Although some support exists for the tenets of reversal theory (see Kerr, 1997), and the fact that it attempts to explain the more positive aspects of the individual's competitive affective experience, the approach has been suggested as offering little in terms of explaining *how* and *why* anxiety (through changes in arousal states) might affect motor performance (cf. Woodman and Hardy, 2001).

ZONES OF OPTIMAL FUNCTIONING (ZOF)

To overcome the limitations of the nomothetic approach to the study of the anxiety–performance relationship, Hanin (1980, 1986) introduced an intraindividual idiographic method to explain how a given level of anxiety could lead to optimal performance. This approach was initially developed as a practical tool for helping athletes 'get in the zone' and determine their optimal levels of unidimensional anxiety within certain limits or bands known as 'zones of optimal functioning' (ZOF) to maximize performance (Hanin, 1980, 1986, 1989). Hanin proposed that every athlete possesses an optimal preperformance anxiety zone within which performance levels were greatest. Anxiety levels below or above these bands were proposed to be consistent with inhibited performance (see Robazza, this volume, for a full description). Dependent upon athlete preferences, therefore, high levels of competitive anxiety could lead to optimal performance. A number of investigations have partially supported the ZOF hypothesis (e.g.,

Annesi, 1998; Gould, Tuffey, Hardy, and Lochbaum, 1993; Krane, 1993; Randle and Weinberg, 1997; Thelwell and Maynard, 1998; Turner and Raglin, 1991; Woodman, Albinson, and Hardy, 1997). The theory itself is also intuitively appealing as it helps to identify an optimal zone for anxiety by employing the individual as a unit of analysis (due to the great variability amongst athletes) and has practical significance for applied sport psychologists in that peak performance can be identified relatively easily (Hardy et al., 1996).

Although ZOF has received criticizm (see Gould and Tuffey, 1996; Hardy et al., 1996; Hardy and Parfitt, 1991; Woodman and Hardy, 2001) the approach has received considerable success in its application to the investigation of a broader range of emotions rather than anxiety alone (cf. Gould and Udry, 1994). A theoretical and methodological framework has subsequently been developed to conceptualize, describe and assess zones of optimal functioning of individuals' emotional states (see Robazza, this volume).

MULTIDIMENSIONAL ANXIETY THEORY (MAT)

In contrast to Hanin's approach that suggests an appropriate emotional zone exists for optimal performance (e.g., high levels of anxiety can have positive performance effects), multidimensional anxiety theory (MAT; Martens, Burton, et al., 1990) describes the relationship between the specific components of the competitive state anxiety response and performance. While self-confidence is predicted to exhibit a positive linear association with performance and somatic anxiety a quadratic or inverted-U relationship (i.e., performance increases up to a given level of symptom intensity), cognitive anxiety is suggested to exhibit a negative linear relationship with performance. Burton's (1998) review of the relationship between the separate components of anxiety and performance indicated that of the sixteen studies examined, only two strongly supported the theoretical predictions (i.e., Burton, 1988; Taylor, 1987); six provided moderate or partial support (i.e., Barnes, Sime, Dienstbeir, and Plake, 1986; Gould et al., 1987; Jones and Cale, 1989; Krane, Williams, and Feltz, 1992; Maynard and Cotton, 1993; Williams and Krane, 1993); and eight provided weak support that was unable to demonstrate any anxiety-performance relationship (i.e., Caruso et al., 1990; Gould et al., 1984; Hammermeister and Burton, 1995; Karteroliotos and Gill, 1987; Martin and Gill, 1991; Maynard and Howe, 1987; Maynard, Smith, et al., 1995; McAuley, 1985).

Although MAT provides some indication of the positive influence that somatic anxiety (up to moderate levels) and self-confidence can have upon

performance, it hypothesizes that elevated levels of cognitive anxiety will invariably be negative and detrimental, with no positive consequences. In addition, the findings from recent meta-analyses suggest weak to moderate relationships between the subcomponents of multidimensional anxiety and performance (e.g., Craft et al., 2003; Woodman and Hardy, 2003) and emphasize both conceptual and methodological shortcomings (see also Burton, 1988, 1998; Jones, 1995a, 1995b; Raglin, 1992; Woodman and Hardy, 2001). One particular criticism is that MAT attempts to explain the additive as opposed to interactive effects of the competitive anxiety subcomponents upon performance (see Hardy, 1990; Woodman and Hardy 2001).

CATASTROPHE MODELS

Hardy and colleagues' cusp catastrophe model describes the interactive effects of cognitive anxiety and physiological arousal on performance (Hardy, 1990; Hardy, 1996; Hardy and Parfitt, 1991). Specifically, in contrast to MAT, elevations in cognitive anxiety can have positive performance consequences contingent upon physiological arousal levels. When cognitive anxiety levels are low, variations in physiological arousal invoke relatively small performance effects characterized by a mild inverted-U type reaction. However, under conditions of high cognitive anxiety, increasing levels of physiological arousal, up to a certain point, will lead to positive effects on performance. Continued increases in physiological arousal may, however, eventually result in dramatic performance decrements characterized by a 'catastrophic' drop in performance levels.

Although a growing body of research has examined the predictions of the catastrophe model the findings are equivocal (e.g., Edwards and Hardy, 1996; Edwards, Kingston, Hardy, and Gould, 2002; Hardy, 1996; Hardy and Parfitt, 1991; Hardy et al., 1994; Krane, Joyce, and Rafeld, 1994; Woodman et al., 1997). This has been suggested to be due in part to methodological issues (see Cohen, Pargman, and Tenenbaum, 2003) and the fact that the catastrophe approach is a model and not a theory and cannot therefore explain the mechanisms through which the anxiety components may interact to effect performance (Hardy, 1996; Woodman and Hardy, 2001).

In their reexamination of the cusp catastrophe model, Cohen et al. (2003) failed to find any empirical and theoretical support for the model's predictions. They also highlighted the need to consider more sophisticated multidimensional approaches and account for potential mediating variables such as self-confidence,

effort, coping and other self-regulatory mechanisms. The five-dimensional butterfly model (Hardy and Parfitt, 1991), incorporating self-confidence and task complexity, would appear to be such a model to assist in understanding how high cognitive anxiety levels may lead to positive performance effects. While no direct test of the butterfly model has as yet been conducted Hardy, Woodman, and Carrington's (2004) preliminary investigation has found some support for the role of self-confidence in such a catastrophe framework.

PROCESSING EFFICIENCY THEORY

A further theoretical approach to explain the notion that high anxious individuals may sometimes perform better than their low anxious counterparts is processing efficiency theory (PET; Eysenck and Calvo, 1992). Based upon Eysenck's (1986) work in the field of cognitive psychology, the experience of high anxiety symptoms is suggested to lead to positive performance consequences (cf. Hardy 1997). Eysenck (1992) purported that cognitive anxiety served two principal functions. Firstly, it consumed some of an individual's attentional capacity for the task, effectively reducing working memory capacity due to task irrelevant cognitive activity or worry, thereby impairing processing efficiency. Secondly, cognitive anxiety or worry also signals the importance of the task to the individual and may lead to an increased investment in the task if a below par performance is perceived. This reduction in effective capacity can be countered by an increased effort (Eysenck, 1986) and while processing efficiency is impaired, performance effectiveness may therefore be maintained or even enhanced under conditions of high anxiety but at the expense of utilizing a greater proportion of the available resources. Preliminary research has supported the application of PET in sport psychology (see Murray and Janelle, 2003; Williams, Vickers, and Rodrigues, 2002), particularly in those sports that tax working memory (cf. Woodman and Hardy, 2001).

Chapter 6

PRACTICAL IMPLICATIONS

This chapter will focus upon the practical implications that emanate from the literature that has examined the positive aspects of competitive anxiety and in particular, the recent emphasis upon directional interpretations associated with the symptom response. Traditionally, stress management strategies have adopted the matching hypothesis (Davidson and Schwartz, 1976) to align individual treatments to specific problems (i.e., cognitive, somatic) via mental skill packages aimed at symptom reduction (e.g., Burton, 1989; Maynard and Cotton, 1993; Prapavessis, Grove, McNair, and Cable, 1992). However, the recent investigation of other anxiety dimensions, such as frequency and direction, has altered how applied sport psychologists practice their profession. Here we discuss two significant practical aspects relating to the type (i.e., approaches to help the performer appraise symptoms in a positive way) and timing (i.e., when these symptoms occur) of stress management interventions.

TYPE OF STRESS MANAGEMENT INTERVENTION

When tailoring interventions to deal with the effects of competitive stress, practitioners should consider the numerous personal and situational variables that have been identified to moderate the competitive anxiety response. For example, while support has been found for the efficacy of psychological strategies (e.g., relaxation techniques) in reducing competitive anxiety intensity and debilitating interpretations of associated symptoms (e.g., Hale and Whitehouse, 1998; Maynard, Hemmings, et al., 1995; Maynard, Smith, et al., 1995) such methods may not be appropriate for the activation and arousal demands of certain sports. In

particular, the reduction of anxiety intensity may decrease the performer's activation state, and subsequent mental and physical readiness for competition. Indeed, it may not be possible, or even desirable, to reduce such symptoms via stress management techniques due to the relative high levels of activation states required for task performance (Hanton and Jones, 1999a, 1999b; Hanton et al., 2000; Hanton, Wadey, and Connaughton, 2005; Mellalieu et al., 2004). In these circumstances practitioners should attempt to initiate a cognitive strategy that restructures negative interpretations of competitive state anxiety, rather than reducing symptom intensity *per se*. Performers may need to reduce symptom intensity, restructure cognitions, and then reactivate to appropriate levels, particularly if individuals possess insufficient confidence to protect against negative interpretations of symptoms. Such a strategy may be relevant for nonelite athletes who consistently report lower self-confidence levels and debilitating symptom interpretations when compared to their elite counterparts (Fletcher and Hanton, 2001; Hanton and Jones, 1999b; Jones et al., 1994). Elite performers who are debilitators may however be better advised to implement some cognitive restructuring techniques using psychological skills and strategies to interpret their anxiety as facilitative to performance including a combination of goal setting, self-talk, and imagery (Hale and Whitehouse, 1998; Hanton and Jones, 1999a, 1999b; Hanton, Wadey, et al., 2005; Jones and Hanton, 1996).

A final practical implication regarding the type of strategy utilized arises from the consistent finding in the individual difference literature that facilitators of symptoms associated with the anxiety response report greater levels of self-confidence than debilitators (cf. Hanton, Mellalieu, et al., 2004). Above all other individual difference variables self-confidence may therefore be the most significant factor in discriminating how athletes manage and interpret stressful situations (Hardy et al., 1996). Indeed, recent meta-analyses by Hardy and Woodman (2003) and Craft et al. (2003) have reported that self-confidence displays the strongest and most consistent relationship with performance over and above the intensity of competitive anxiety symptoms experienced.

The nature by which athletes use self-confidence to manage stress was identified in Hanton, Mellalieu et al.'s (2004) qualitative investigation of the relationship between self-confidence and competitive anxiety intensity and symptom interpretation. In this study, elite performers reported using cognitive confidence management strategies including mental rehearsal, thought stopping, and positive self-talk to protect against debilitating interpretations of competitive anxiety. The performers also highlighted that the specific antecedents of self-efficacy, in particular, images of enactive mastery, were utilized when employing cognitive confidence enhancement strategies. Hanton, Mellalieu et al.'s (2004)

findings suggest that practitioners should focus upon developing confidence protection strategies that build robust perceptions of the athlete's enactive mastery or performance accomplishments, as they appear to have the most salient influence upon self-confidence symptoms and protection against anxiety debilitation. In conjunction with the use of mental imagery, individual-specific mental skill packages should therefore be developed that incorporate other forms of efficacy enhancement. These may include forms of verbal persuasion such as positive self-talk or external encouragement from the coach or significant others.

TIMING OF STRESS MANAGEMENT INTERVENTION

When considering suitable stress management interventions practitioners also need to account for the temporal nature of the stress response from both a macro and micro perspective. At a macro level we can consider the temporal nature of how performers' responses change across their career, while at a micro level we can explore the temporal patterning of the precompetitive response in the build up to a specific event or competition.

One example of the study of temporal responses at a macro level is Hanton and Jones's (1999a) investigation of the cognitive skills and strategies underlying elite swimmers' interpretations of prerace thoughts and feelings, from early experiences through to their current status. In their study the authors identified that the development of positive perceptions of prerace symptoms occurred via natural experiences and various educational methods. Specifically, the swimmers reported that at an early age they were told prerace nerves could be positive and subsequently, with experience, they began to interpret their symptoms in a facilitating manner towards performance. The implications of these findings are that at an early stage in their careers athletes need to be educated that emotions and thoughts and feelings experienced in the precompetition period as unpleasant or discomforting may not necessarily be debilitative or harmful to competition. Consequently they should be taught the key psychological skills, such as the use of goal setting, self-talk, and imagery, as part of the mental preparation element of their prerace routine to enable effective stress management (Hanton and Jones, 1999a).

At a micro-level, several studies have identified that the patterns of change in the cognitive labeling of affective states in the precompetition period may be as significant as the type and intensity of feeling reported by an athlete (e.g., Hanton, Thomas, et al., 2004; Mellalieu et al., 2003; Thomas et al., 2004). For the practitioner these findings suggest that a detailed assessment of an athlete's

precompetitive temporal patterning state is required. This will allow the implementation of a series of carefully designed cognitive intervention strategies to manage not only the intensity but also the frequency and direction of the performers' thoughts and feelings across a temporal range beyond that of the traditional hour before competition. One such approach was adopted by Hanton and Jones (1999b) whose multi-modal intervention with competitive swimmers consisted of teaching the psychological skills of goal setting, imagery and self-talk in order to change interpretations of symptoms associated with anxiety from debilitative to facilitative in the pre-race phase over the course of a competitive season.

Chapter 7

FUTURE DIRECTIONS

In light of the recent the body of literature that has investigated the positive consequence of the anxiety response upon performance and the study of the cognitive and motivational processes underpinning this relationship several areas are apparent for further study. These include the conceptualization and measurement of competitive stress, the study of existing and additional moderators of symptom interpretation, and the integration of theoretical approaches to explain the anxiety-performance relationship.

CONCEPTUALIZATION AND MEASUREMENT

The conceptual issues outlined briefly in this chapter and discussed in detail by Fletcher et al. (this volume) reveal a number of important implications for future research. First, the competitive stress process should be viewed as a dynamic rather than a static event (Lazarus, 1999). Methods and instruments need to be designed to assess the overall phenomenon and incorporate the competitive stressor, affective response, coping strategy, and subsequent behavior (Cerin et al., 2000). These may include full and single item psychometric measures, interviews, experience sampling methods (ESM), and possible behavioral assessment techniques. Although such procedures are common in the applied and professional practice literature, comparison of one method to the other or several methods collectively, have not specifically been examined. Recent advancements have been made towards the use of such measures through the adoption of short form and in-event assessment (Cerin et al., 2001; Eubank and Collins, 2000;

Thomas et al., 2002), and retrospective recall (Tenenbaum, Lloyd, Petty, and Hanin, 2002; Wilson, Raglin, and Harger, 2000).

Recent research examining the competitive stress process also suggests that anxiety alone accounts for little variance in performance when compared to the 'recipe of emotions' that constitute the broader affective precompetitive response (Cerin, 2003; Gould and Udry, 1994; Robazza, this volume). Performers not only appear to differ in the type of affective state experienced but also in the labeling of that response towards performance (Fletcher et al., this volume; Hanton and Mellalieu, in press; Jones and Hanton, 2001; Mellalieu et al., 2004). Rather than focusing exclusively on the anxiety component of the stress process future studies should consider designs that incorporate the idiosyncratic nature of mental states (Hanin, 1997, 2000) and the range of cognitive, affective, and behavioral experiences that have been identified in the lead up to competition. One example is Cerin's (2004) recent multilevel mixed idiographic/nomothetic interactional study of the intensity and direction of competition anxiety and affect in the week leading up to competition in Tae Kwon Do practitioners. Cerin considered the interaction of both personal (positive and negative affect) and situational factors (temporal proximity) in moderating the relationship with anxiety direction, affective responses and proximity to competition. The adoption of such designs in future will allow researchers to identify and explain both the intra- and inter-individual differences that may occur in the competitive stress process.

INDIVIDUAL DIFFERENCES

A further line of research into the study of competitive anxiety is to continue to examine the individual difference factors that predict debilitated and facilitated symptom interpretations in performers. In our earlier section we summarized the findings and key implications from these individual differences and in this section we highlight three potential lines of enquiry emphasized by several of these authors in relation to the study of perceived control, psychological skills usage, and the development of competitive experience respectively. We then draw attention to some additional situation and personal variables that are also considered worthy of future investigation.

Although the notion of control is central to Jones's (1995a) model of debilitative and facilitative anxiety and while behavioral, affective, and physiological consequences are suggested to be influenced as a function of locus of control beliefs, little empirical evidence exists regarding the direct relationship between control perceptions and athletic performance (Ntoumanis and Jones,

1998). Several qualitative and empirical investigations have provided indirect support for the model (e.g., Hanton and Connaughton, 2002; Hanton, Mellalieu, et al., 2004; Hanton, O'Brien, et al., 2003) but few studies have assessed its relationship with the stress response directly and with contemporary measurement procedures (cf. Fink, Johnson, and Porter, 2001; Ntoumanis and Jones, 1998). The underlying mechanism for this process, particularly how symptoms are appraised in a positive manner towards performance, presents an area worthy of further consideration. Ntoumanis and Jones (1998) also recommended exploring the individual difference factors which can mediate the adoption of a particular locus of control.

Another area worthy of attention is the psychological skills used by performers to maintain a degree of control over the competitive stressor. Fletcher and Hanton (2001) suggested that future research in this area should examine the effectiveness of different interventions in eliciting positive symptom interpretations and performance improvements, particularly the efficacy of one strategy versus another, or the effects of combining different strategies to form a psychological skills package. They also highlighted the need to identify which psychological skill, or their combination, most contributes to the affective response in conditions of competitive stress.

A further important avenue to pursue is how performers learn to develop the necessary psychological skills in order view their precompetitive symptoms experienced in a positive manner towards performance. Hanton and Jones's (1999a) qualitative investigation of elite swimmers suggested that psychological skills were developed via a combination of natural learning experiences and various educational methods. The authors recommended that future investigation was needed to corroborate and detail these learning experiences across other sport type samples and classifications. One such study by Mellalieu et al. (2004), for example, has found that differences existed in symptom interpretation in several sports as function of the level of experience. Hanton and Jones (1999a) have also highlighted the need to identify the time scale and amount of competitive experience required in order for a performer to develop the necessary psychological skills to interpret cognitive and somatic symptoms as facilitative even in the most stressful of environments.

In addition to the investigation of existing moderators of the competitive stress response the study of other potential factors is also worthy of attention. With regard to situational factors, the wider effects of psychosocial factors upon the competitive stress response would seem to be a fruitful area of inquiry. While there has been considerable development in the understanding of the constructs that contribute to the development of positive dynamics in teams such as cohesion

(see Loughead and Hardy, this volume) and collective efficacy (cf. Feltz and Lirgg, 1998; Spink, 1990), there has been little or no study of the potential negative effects of competitive stress. For example, Hanin (1986) has discussed the notion of inter-group anxiety among teams and groups, while negative relationships have been observed between perceptions of group dynamics and intra-individual competitive anxiety responses (Beauchamp, Bray, Eys, and Carron, 2003; Eys et al., 2003).

As well as the examination of situational factors, there is also a need to consider the specific effects of personal moderators upon the competitive stress response. Preliminary investigations of resilience traits such as self-confidence, hardiness, extraversion, and positive affectivity would appear to suggest differences in coping behaviors and stress responses (e.g., Cerin, 2004; Hanton, Evans, et al., 2003; Hanton and Mellalieu, in press). The study of these and other traits such as determination, optimism and enthusiasm (cf. Carver and Scheier, 1999) that represent some form of psychological resilience or mental toughness may allow researchers greater comprehension of athletes' psyche. Evidence from the personality literature in a variety of organizational and social environments also suggests powerful predictive potential of general theories of personality, such as the big five (McCrae and Costa, 1996). Given these recent advancements in the assessment of dispositional traits (cf. McCrae and Costa, 1997) clear potential exists for a re-examination of the role of personality in sport. There is also a need to consider the effects of individuals with repressive coping styles on the accuracy of self-report anxiety questionnaires (cf. Jerome and Williams, 2000; Jones et al., 1994). Indeed, a failure to account for individuals who deny having elevated levels of symptom intensity may result in cases of individuals being denoted as low-anxious on self-report items when in fact they are actually repressors.

THEORETICAL INTEGRATION

While this chapter has alluded to several theories and models that purport to explain the positive effects of anxiety in relation to competition, such as ZOF, MAT, catastrophe models, and PET, there is a need to incorporate these existing conceptual approaches to provide an integrated explanation for the anxiety-performance relationship. Davis and Cox (2002) for example, combined the assessment of ZOF and anxiety direction in their investigation of anxiety-performance relationships in competitive swimmers, while other researchers (e.g., Edwards et al., 2002; Woodman and Hardy, 2001) have highlighted the potential shared variability in catastrophe models and PET and between specific theories

such as the conscious processing hypothesis (Masters, 1992) and the theory of ironic processes of mental control (cf. Wegner, 1997) to explain the potential positive consequences of anxiety-upon performance.

Further progress must also be made in relation to the mechanisms by which anxiety and related symptoms (see Robazza, this volume) actually influence performance (cf. Janelle, 2002; Jones, 2004; Mellalieu, 2003). For example, in acknowledging existing stress-performance theories Janelle (2002) pointed out that there is little empirical evidence to document the mechanisms that underlie the proposed performance changes. Existing theories merely purport attentional mechanisms to be responsible for how fluctuations in emotional, cognitive and physiological states might manifest themselves in performance variability. Janelle (2002) has provided some progress to overcome these and other limitations in order to account for the variation in athletic performance through his description of the relationship between anxiety, arousal and visual attention.

In attempting to explain anxiety effects on performance, there is also a need to examine the influence upon each of the individual components of performance (Parfitt et al., 1995; Parfitt and Hardy, 1993). Parfitt and Pates's (1999) adoption of a broadband approach to the investigation of the anxiety performance relationship (i.e., the effect of one stressor on several sub-components of performance) has identified that different competitive state responses (cognitive and somatic anxiety, self-confidence) exert differential effects upon aspects of actual performance (anaerobic power, working memory). The adoption of an interdisciplinary approach may be particularly useful here, for example, Collins and colleagues (Collins, Jones, Fairweather, Doolan, and Preistly, 2001) have used movement kinematics to evaluate changes in movement patterns associated with concurrent changes in anxiety levels. Among their findings support was found for the notion that one of the mechanisms via which anxiety influences performance was through the interaction of task constraints and individual movement control parameters, which lead to consequent changes in action. Combining these and other interdisciplinary methods provides an interesting avenue and challenge for researchers to assess the apparent complex explanations for the mechanisms by which the competitive stress response influences performance.

CONCLUDING REMARKS

This review is the first to consider in detail the beneficial side to competitive anxiety in sport, and the positive consequences associated with the competitive stress response as opposed to the traditional focus on the potentially negative effects on performance. Specifically, we explored the mechanisms by which such a negative emotional response might have a positive effect on a performer's psychological state and subsequent athletic performance. Based on the literature reviewed here, and the predictions of the meta-model of stress, emotions and performance (Fletcher and Fletcher, 2005; Fletcher et al., this volume), we outline five statements that summarize our current position regarding competitive anxiety and sport performance:

1. Competitive stressors are not inherently positive or negative.
2. Performers' appraise these stressors resulting in positive and/or negative responses.
3. Competitive anxiety is an example of a specific negative emotional response.
4. Cognitive and somatic symptoms of competitive anxiety (together with other competitive stress-related emotions) are further appraised as facilitative or debilitative to performance, resulting in positive or negative feeling states.
5. These feeling states can have a positive or negative effect on performance.

We hope these statements serve to provide a clear basis for future conceptualization of the competitive stress process, and the relationship between anxiety and athletic performance.

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