

A qualitative investigation of the temporal patterning of the precompetitive anxiety response

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The aim of this study was to examine retrospective perceptions and causal beliefs about temporal experiences of competitive anxiety and related symptoms in the lead up to competition. Qualitative interviews were conducted with 9 elite performers to examine the interaction of intensity, frequency and direction of symptoms associated with competitive anxiety before competition. Data analysis identified six causal networks that supported theoretical predictions suggesting that intensity of cognitive anxiety symptoms remained relatively stable in the lead up to competition, whereas somatic anxiety peaked sharply at the onset of performance. Frequency of anxiety symptoms increased as the competition approached and changes in interpretation of anxiety symptoms were also reported, with self-confidence identified as a moderating variable. The findings highlight the dynamic properties of the stress response and emphasize the need to consider the idiosyncratic nature of the level, frequency and interpretation of performers' precompetitive experiences.

Keywords: competitive anxiety, direction, frequency, intensity, temporal patterning.

Introduction

Understanding the nature of the temporal patterning of an athlete's precompetitive responses is important for applied practitioners in terms of the content and timing of intervention required to regulate or protect against any negative symptoms experienced (Cerin *et al.*, 2000). One potentially debilitating symptom that has received considerable attention in empirical sport psychology research is that of multidimensional competitive anxiety (Martens *et al.*, 1990). Studies of the temporal patterning of the precompetitive anxiety response have typically used a 'time-to-event' paradigm to measure symptom intensity at periodic intervals, normally 2 days, 24 h, 2 h and 1 h before competition (for a review, see Cerin *et al.*, 2000). Theoretical predictions about the specific patterning of multidimensional anxiety symptoms suggest that cognitive anxiety and self-confidence are predicted by an athlete's performance expectations and perceptions of ability. Both constructs are proposed to

remain stable in the lead up to a competition, provided that expectations about performance also remain stable (Jones *et al.*, 1990). Somatic anxiety is considered to be a conditioned response to the environmental stimuli associated with competition and is proposed to remain relatively stable over the precompetitive period, exhibiting a sharp increase at the onset of performance and dissipating once the event has commenced (Martens *et al.*, 1990). Empirical support for these predictions comes from several quarters (e.g. Gould *et al.*, 1984; Ussher and Hardy, 1986; Jones and Cale, 1989), with individual difference effects also observed, including sex (Jones *et al.*, 1991) and type of sport (Krane and Williams, 1987).

Although previous investigations have advanced the understanding of the nature of the precompetitive anxiety response, they are somewhat limited because only the intensity of the symptom experienced was assessed. Jones (1991, 1995), who argued that the notion that cognitive anxiety should be at the same level a week before competition as it is one hour before, merely referred to the intensity of cognitive anxiety symptoms experienced on two occasions. Subsequently, this was

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unlikely to provide a true representation of the performer's cognitive state. To further our understanding, Jones and associates introduced the concept of 'frequency' of competition-related intrusions (i.e. the proportion of time competition-related cognitions occupy a performer's thoughts). In an empirical investigation to test these predictions, Swain and Jones (1993) examined the frequency and intensity of precompetitive anxiety in collegiate male and female track-and-field athletes. Although intensity of symptoms conformed to theoretical predictions and remained stable (provided expectations of success did not change), the frequency of cognitive and somatic anxiety intrusions was found to increase significantly as the competition approached. Furthermore, a week before competition, anxiety-related cognitions appeared to be relatively transitory compared with the extent to which they dominated thoughts directly before the event. Commenting on their observations, Swain and Jones noted that the 'intensity alone' approach provided limited information, as it merely informed researchers of the relatively constant levels or intensities experienced. Adoption of the frequency dimension, however, suggested that the precise nature of this cognitive anxiety response may change during the precompetition period. Specifically, they noted that the cognitive state associated with such a level was likely to differ as a function of the proximity of the event (Swain and Jones, 1993).

More recent findings have revealed that other dimensions of the competitive anxiety response, in addition to intensity and frequency, may also play an important role in influencing performance. In particular, the dimension of 'direction' of an individual's interpretations of thoughts and feelings (i.e. as facilitative or debilitating to performance) has received considerable attention. Support for this distinction has been provided in a growing body of literature examining a wide range of personal and situational variables in the competitive anxiety direction response, including competitiveness (Jones and Swain, 1992), performance (Jones *et al.*, 1993; Swain and Jones, 1996), the antecedents of competitive anxiety (Hanton and Jones, 1997), differences between the sexes (Perry and Williams, 1998), temporal patterns of the anxiety response (Wiggins, 1998), competitive trait anxiety (Hanton *et al.*, in press) and the use of psychological skills (Fletcher and Hanton, 2001). In spite of this advance in the understanding of interpretations of symptom intensity, few empirical studies have examined the temporal patterning of anxiety direction.

In hypothesizing about the nature of this relationship, Jones (1995) suggested that performance expectations are linked to directional interpretations; therefore, as competition draws nearer, interpretation of symptoms may change. Wiggins (1998) studied this relationship in

a sample of collegiate athletes from several sports and observed that anxiety intensity symptoms followed the original predictions of Martens *et al.* (1990). However, in contrast to Jones' proposals, although overall participants reported facilitating interpretations of symptoms, neither cognitive or somatic anxiety direction, nor self-confidence or performance expectations, changed significantly over the time leading up to the event. Wiggins did speculate that the lack of any changes might have been due to the study not measuring responses any earlier than 24 h before the event. Indeed, the literature is dominated by studies that examined anxiety responses 1 or 2 h before performance. Despite this, some support does exist for Jones' (1995) proposals. Mellalieu *et al.* (in press) observed changes in patterns of interpretations of anxiety when performers were asked to differentiate between symptoms experienced about preparation for performance and about the impact on actual forthcoming performance. Notably, many performers experienced symptoms associated with competitive anxiety as facilitative for preparation but debilitating for performance. The authors suggested that the findings may be distinguishing between preparatory and performance anxiety experienced by athletes (cf. Burton, 1998), such that symptoms associated with competitive anxiety experienced earlier in the temporal period are perceived as facilitative and preparatory for performance, whereas symptoms experienced directly before competition are viewed as more debilitating.

Although traditional quantitative investigations allow some understanding of the temporal patterning of the competitive anxiety response by indicating changes in symptoms in the time to event, little information exists for the exact mechanisms or relationships as to *why* interpretations of symptoms may change. Further investigation is required, therefore, of the temporal aspects of the competitive anxiety response through the use of different methodologies (cf. Cerin *et al.*, 2000). Recent advances in other aspects of competitive anxiety research have been achieved through the adoption of in-depth methods of investigation. Specifically, qualitative studies have sought to understand how anxiety symptoms, self-confidence and directional perceptions interact to impact upon perceptions and expectations of performance (Hanton and Jones, 1999a; Hanton and Connaughton, 2002). Here, perceived control and self-confidence have been found to moderate interpretation of competitive symptoms through the use of cognitive confidence management strategies to protect against debilitating interpretations associated with anxiety (Hanton and Jones, 1999a,b; Hanton and Connaughton, 2002).

The literature on temporal patterning effects of competitive anxiety highlights several areas of weakness.

First, a relatively limited body of empirical research has investigated temporal patterning responses as a function of anxiety frequency and direction. Second, studies have traditionally examined the additive rather than interactive effects of anxiety symptoms (Hardy, 1996). Finally, the existing quantitative approach to investigating temporal patterning effects of competitive anxiety has merely indicated changes in symptoms, with little understanding of the precise nature of the relationship between anxiety components. In light of these limitations, the aim of this study was to examine elite athletes' retrospective perceptions and causal beliefs about temporal experiences of competitive anxiety and related symptoms in the time before and leading up to competition. Consistent with recent anxiety studies that have adopted the use of alternative approaches to establish detailed information (e.g. Hanton and Jones, 1999a; Hanton and Connaughton, 2002), the present study adopted a qualitative approach. Specifically, interviews were used to probe performers' perceptions of the mechanisms by which intensity, frequency and direction of symptoms associated with competitive anxiety interacted in the build up to competition and the subsequent effect upon preparation for performance.

Methods

Participants

Selection of participants was conducted using purposive sampling procedures (Lincoln and Guba, 1985; Patton, 1990). Specifically, information-rich cases were selected whose study would illuminate the questions under investigation (Patton, 2002). Information-rich cases are those that allow the investigator to learn a great deal about issues of central importance to the purpose of the research.

Nine elite male competitive athletes were informed of the nature of the study and invited to take part, all of whom agreed. The participants were aged 19–27 years (mean $\pm$ s: 24.5 ± 2.2 years). A single-sex design was used, as previous anxiety–performance studies have highlighted differences between the sexes (Jones *et al.*, 1991; Perry and Williams, 1998). The criteria for 'elite' were based upon previous classifications (e.g. Hanton and Connaughton, 2002), which required that participants had to be currently competing or had previously competed internationally at major championships, such as the Olympic Games, European and World Championships. The participants had been competing at elite standard for 3–8 years (4.73 ± 4.18 years). They were drawn from team and individual sports, including rugby union ($n = 2$), soccer ($n = 2$), swimming ($n = 3$),

gymnastics ($n = 2$) and modern pentathlon ($n = 1$). Written informed consent was obtained from each individual before participation; confidentiality of information was emphasized.

Design

Qualitative methods of data collection were adopted, since such techniques allow the researcher to study the issue of concern in great depth and detail (Patton, 2002). In accordance with previous interview procedures (i.e. Gould *et al.*, 1993; Hanton and Jones, 1999a; Hanton and Connaughton, 2002) and to aid retrospective recall, an interview guide was developed for the purpose of the study (available from S.H.). Both open and closed sport-specific questions were generated from empirical findings examining the temporal patterning of the intensity, frequency and direction of competitive anxiety symptoms. The interview schedule was pilot tested on a sample of highly experienced performers ($n = 4$) deemed to be representative of the population to be sampled and minor refinements were made to the question narrative.

The full interview schedule was divided into four sections. Section 1 contained introductory comments, the purpose and definitions of the study, together with a declaration of the individual's rights. Participants were then asked about competing at recent important events; if recall was problematic, they were asked to take their time, and if they still could not remember, to tell the interviewer rather than guess (no participant stated experiencing recall problems during the interviews). It was also made explicit to the participants that they could draw upon all aspects of their experience as a competitive athlete to create an overall framework (Scanlan *et al.*, 1989). To help establish the parameters of the study and familiarize the participants with self-reflection, section 2 of the guide asked questions relating to training regimes, competitive history and personal reasons for competing. The third and main section of the interview comprised general and specific questions related to the athlete's thoughts and feelings at different times before the most recent major competition participated in, and the effects of these symptoms on preparation for forthcoming performance. To 'frame' the temporal context and aid recall (cf. Scanlan *et al.*, 1989; Hanton and Jones, 1999a), the participants were first orientated to clarify and describe the required time periods experienced before competition and asked to recall, describe and explain their cognitive and somatic experiences at the identified time phases. The participants were then asked to address such issues as perceived control and directional interpretations and explain why the identified symptoms were perceived as positive or negative at these points in time and how

they influenced preparation for performance (i.e. provide a causal explanation). In accordance with previous literature, the participants were asked about their experiences 2 days, 24 h, 2 h and 1 h before performance (cf. Cerin *et al.*, 2000). However, the pilot study indicated that, 2 days before competition, cognitive and somatic experiences were viewed as having little or no bearing upon preparation for forthcoming performance. Subsequently, this time period was removed from the question schedule of the main study (this was also verified by participants in the main study). The closing section of the schedule summarized the interview experience and invited the participant to discuss any thoughts or issues the researcher may have overlooked.

Procedure

To maximize retrieval of in-depth data and facilitate recall, a copy of the interview guide was sent to each participant asking them to reflect on their answers in preparation for the interview 1 week before its scheduled time (James and Collins, 1997). The interview schedule itself had a structured format whereby each participant was taken through an identical set of questions, asked in a similar fashion. Throughout, the interview questions were followed where appropriate by elaboration probes to further aid recall and detail of information retrieval (Patton, 1990). All interviews were conducted face-to-face and away from the competitive environment to minimize any possible situational influences, such as the atmosphere at the competition. To enable accurate recall of symptoms and experiences, the interviews were conducted within the time frame of the participants' competitive season (cf. Edwards *et al.*, 2002). Specifically, to minimize memory distortions, the participants were interviewed within 2 weeks of competing at a major event, tournament or championship. The interviewer, an experienced competitive athlete, possessed the ability to converse at a sport-specific level and empathize with the participant. The interviews were tape-recorded in their entirety and transcribed verbatim, yielding more than 250 single-spaced typed pages. The interviews lasted between 60 and 90 min.

Analysis

Data regarding athletes' causal beliefs about the temporal patterning of symptoms associated with anxiety intensity, frequency and direction, and self-confidence were analysed and displayed by means of causal networks (Miles and Huberman, 1994). Such networks are described as a visual representation of the relationships (shown by arrows; see Figs 1–6) between the most

important variables in an investigation. Networks contain streams, which are unbroken chains of variables, and consist of multiple channels that either lead in different directions or end up at the same place via a different route (Miles and Huberman, 1994). In addition, the networks are supported by associated analytic text to describe the meaning of the connections among factors. Causal networks, therefore, provide visual representations of the data that bring together the variables supported by an accompanying narrative to explain emerging relationships in a coherent way (Hanton and Connaughton, 2002). Recent studies by Hanton and his associates have successfully adapted this procedure to sport psychology by addressing the relationship between perceived control, self-confidence and anxiety interpretation (Hanton and Connaughton, 2002).

The analysis for the present study consisted of six stages. First, the authors studied all transcripts to ensure content familiarity. Second, causal streams were identified in the form of quotations from the transcripts. Specifically, these were identified and coded by sentiments (raw data quotations), such as 'The day before I would begin to think about it. Usually it's thoughts of me performing in different situations in the competition'. Third, separate deductive networks were developed for each theme and the frequency of each stream was recorded. Fourth, deductive analysis was conducted to verify that all themes were present. Fifth, to control researcher bias, consensus validation was employed by having each investigator independently identify the streams. Subsequently, each stream and network was discussed until agreement was reached. In addition, an independent experienced qualitative researcher, familiar with the competitive anxiety literature, was asked to confirm all networks (i.e. that the maps reflected the sentiments contained within the transcripts). Finally, network maps were sent to all participants and comments regarding their accuracy were solicited. All participants confirmed that the networks accurately reflected their precompetition experiences and causal beliefs about their psychological experiences in the time to event.

Results

Analysis of the transcripts of participants' responses produced causal streams resulting in six conceptual frameworks depicting the reported experience of both cognitive and somatic symptoms associated with competitive anxiety and the subsequent perceived effects upon preparation for performance in the time to competition (Figs 1–6). The frameworks consist of two major elements: (1) a set of variables linked together by a series of arrows illustrating the relationship direction,

and (2) for each of the variables a percentage of the number of participants who identified the symptoms and their perceived effects on performance. Where two or more different symptoms led to an identical experience, the percentage is presented in **bold** typeface, illustrating that the percentage has emanated from more than one symptom. Because of the direction of the relationship, the maps are best interpreted from left to right. The data identify the actual symptoms experienced together with the athlete's personal explanation of these symptoms, the level of perceived control felt and the resultant directional interpretation of the symptoms (facilitative or debilitating). Finally, the data show the performer's belief about how these factors affected self-confidence and preparation for forthcoming performance at each time phase. Accompanying the networks is a descriptive summary of the results to enable the reader to compare between the two forms of display. To clarify analysis points, quotations from the transcripts are also included. The findings are first presented in terms of common patterns of symptoms and general observations noted across all three temporal phases. Each specific temporal network is then discussed separately.

General observations of anxiety symptoms experienced across all three temporal phases

Figures 1–6 display the data in a consistent pattern, which suggests an increase in frequency of cognitive and somatic symptoms experienced in the time to performance. Intensity of cognitive responses appeared to remain relatively stable, whereas somatic experiences were suggested to peak at the onset of competition. An examination of anxiety direction responses indicated that perceived control and self-confidence were moderating variables in the performers' interpretations of symptoms as either facilitative or debilitating towards preparation for performance. Cognitive and somatic symptoms deemed to be under the performers' personal control were indicated to lead consistently to a positive directional interpretation, increased self-confidence and, ultimately, a perception that preparation for performance would be enhanced. For example, one performer stated: 'The increase in the intensity and amount of [competition-related] thoughts I get doesn't bother me because I am confident enough to stay positive and focus on my race coming up later on. I know I can control my thoughts and stay confident and focused'. Cognitive and somatic symptoms that were perceived to be outside of the performers' control were suggested to lead to debilitating interpretations of symptoms, lower self-confidence and a subsequent negative effect upon preparation for performance. As one performer highlighted, 'Sometimes . . . in the build up to competition, I

get more doubts and I don't feel as good about doing well. I can't seem to block out the thoughts and worries as much'.

An important variable described as influencing perceptions of control and anxiety interpretation was the amount of self-confidence experienced and the use of mental skills to sustain or increase this self-confidence. Across all time frames, high self-confidence allowed performers who were experiencing competition-related symptoms to focus only on positive thoughts and feelings. This was deemed to reduce or 'protect' against any negative cognitive or somatic symptoms (100% experienced: Fig. 1, network A). Self-confident thoughts were also suggested to allow performers to focus on achieving a positive pre-performance routine (22%) to maintain appropriate levels of activation (Fig. 3, network C). Low feelings of self-confidence were suggested to lead performers to focus on negative thoughts and feelings experienced (100%) and cause a loss in focus and concentration in the preparation for competition (Fig. 2, network B). Similarly, low self-confidence allowed the experience of negative thoughts and experiences to lead to poor performance preparation (67%) and increased worry and self-doubt (Fig. 4, network D).

Protection of self-confidence, the subsequent experience of positive perceptions of control and facilitating interpretations of anxiety symptoms were suggested to be maintained by the use of specific cognitive strategies. In particular, mental rehearsal and cognitive restructuring techniques were suggested to help the performer to focus on positive thoughts and ignore or reduce any negative symptoms experienced. A typical comment was: 'There are a lot of thoughts and feelings . . . I get rid of the negative ones by staying focused on the positives and thinking about what I am going to do later in my race, seeing myself performing well . . . that keeps me strong and focused'.

Performers also reported interpretation of anxiety symptoms to change across the temporal phases in the lead up to performance. This was thought to be dependent upon the use of mental skills to sustain self-confidence and subsequent positive perceptions of control over symptoms. 'Change' in symptom interpretation was especially evident between the temporal phases 2 h and 1 h directly before performing. For example, one performer stated:

Certainly, your interpretation of your feelings can change . . . being concerned, a little apprehensive and having the nervous feelings in your stomach in the build up to running is good and I see that as beneficial to my preparation. But if I feel that I let that get to me, then I get more thoughts and worries and if it's more intense then I don't want that feeling . . . that's bad for me.

Causal networks A and B: symptoms experienced 24 h before competition

Twenty-four hours before competition, performers identified the beginning of an increase in the frequency of competition-related thoughts and feelings. The primary antecedent cited for these symptoms was the perceptions of the relative importance of the forthcoming competition. If the event was deemed important to the individual, increases in competition-related cognitions and feelings were reported. A lack of perceived competition importance was thought not to elicit any significant competition-related symptoms at this particular temporal phase.

Network A (Fig. 1) presents the cognitive and somatic symptoms that participants deemed to be within their personal control and were interpreted as facilitative to preparation for performance. These experiences were reported to produce higher self-confidence and increase preparation for performance. Several attributions emerged for the perceived increase in self-confidence and enhanced preparation for performance. First, it was suggested that an 'increase in thoughts about competition' (78%) lead to a focus on good performance (33%). Second, the reduction of self-doubts or worries was deemed to allow regulation of the performers' activation levels. Finally, the enhanced self-confidence was suggested to lead to the maintenance of 'positive perceptions of control' (11%). One performer stated: 'I usually start thinking about the competition 2 days beforehand. I get lots of thoughts, I just try to think positive and stay with the good ones. That stops any doubts or concerns and helps me stay relaxed and not over-anxious'. Increases in the frequency of physiological symptoms were reported to enhance both focus and effort (89%). Specifically, symptoms were seen as part of the 'build-up' of preparation for performance (55%), eliciting excitement as a consequence of the 'perceived challenge' (33%), or were associated with positive forthcoming performance (22%). As one performer stated, 'You start to feel the buzz a few days beforehand . . . the stomach, the legs, you can feel yourself performing well'.

Network B (Fig. 2) presents the symptoms that were deemed to be outside of the performers' personal control and interpreted as debilitating to preparation for performance, leading to reduced self-confidence. Increases in the thoughts experienced about competition (89%) were suggested to cause self-doubts and worry and lead to a focus on negative aspects of performance, with a subsequent loss of focus and concentration (89%). Competition-related thoughts and experiences that were associated with previous poor performances were suggested to lead to negative expectations of upcoming competition and symptoms

that were perceived to be out of the control of the performer (55%). Physical symptoms experienced (100%) were reported to be associated with previous negative performances (44%) and self-concerns (67%). These were thought to lead to more self-doubt and worries about performance and to increase perceptions of a lack of control over symptoms experienced. For example, 'Once the build up begins, the thoughts start and you get the doubts. Physically you don't feel so good and that just adds to it all. When I feel that way it reminds me of my poor races'.

Causal networks C and D: symptoms experienced 2 h before competition

Figures 3 and 4 display the cognitive and somatic symptoms experienced by participants 2 h before competition and show an increase in the frequency of competition-related thoughts and experiences compared with the previous temporal period. Specifically, the participants reported an increase in the amount of cognitions and experience of somatic anxiety and physiologically related symptoms concerning the forthcoming competition. The antecedents of symptoms experienced were suggested to be the participants' arrival at the competition venue, their perceptions of the performance environment and subsequent appraisal of readiness to perform. Symptoms within personal control and interpreted as facilitative were believed to improve self-confidence and subsequent preparation for performance (Fig. 3). Within this stream, two attributions emerged for the perceived increase in preparation for performance. Experience of physiological symptoms was viewed by some participants as being associated with readiness to perform at the competition and was suggested to act as a focus for the physical preparation routine or warm-up (67%). Physiological symptoms that were perceived as being part of the participants' positive preparation for performance and the precompetition routine (44%) were then believed to lead to an enhanced focus and effort towards preparation for performance (100%). One performer stated: 'The buzz that begins to build a few hours before is good. To me . . . it's [the buzz] all part of the normal things I do and feel on the day of racing. The effect? . . . I guess it just begins to switch me on and get me directing my energy towards the race'. In addition, the experience of competition-related thoughts was seen to be positive for performance and representative of a successful preparation routine. This was believed to reduce any negative symptoms experienced and raise the performer's activation state to an appropriate level (33%), thereby enhancing focus and effort and increasing preparation for performance.

Those individuals who ultimately reported debilitating experiences towards preparation for performance

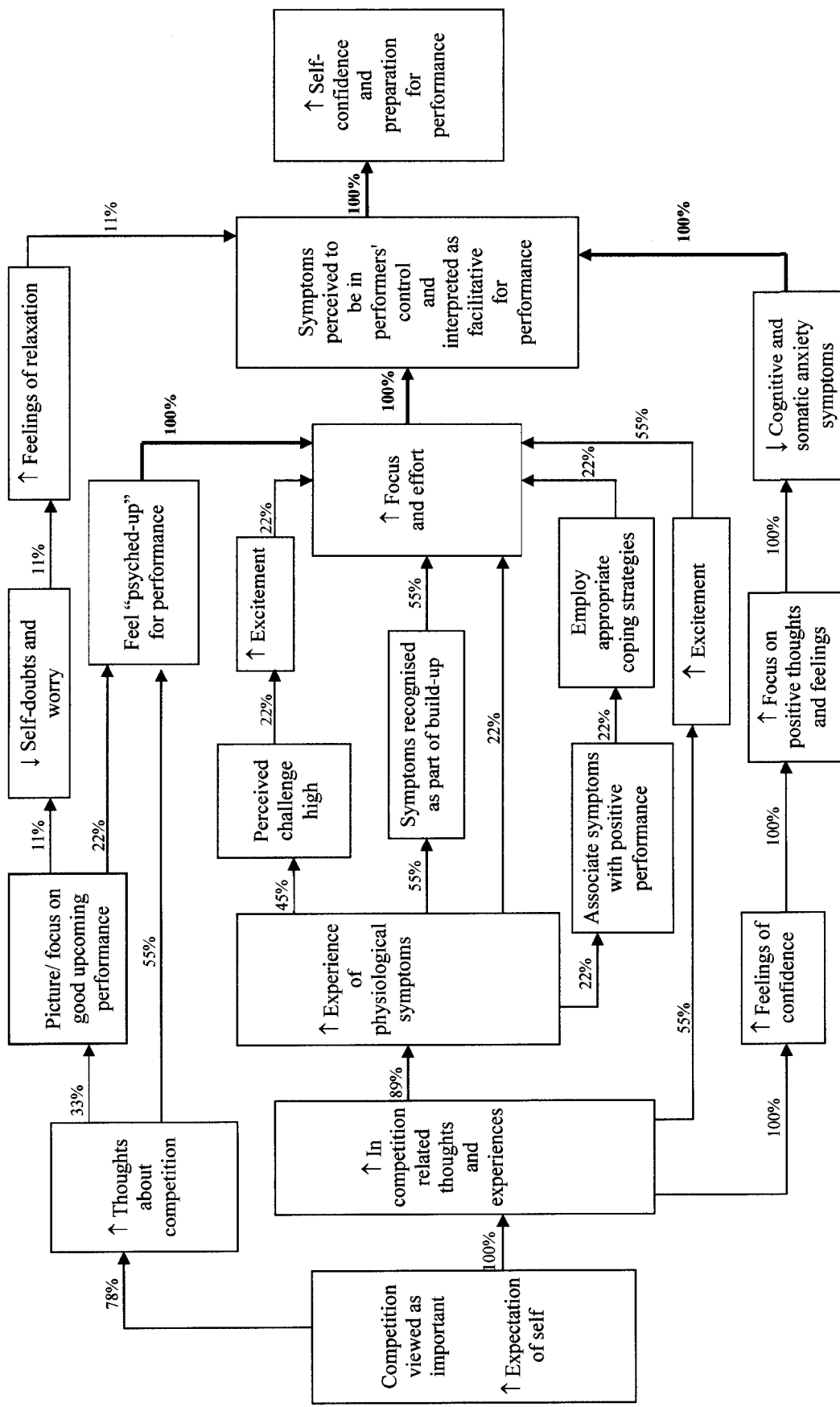


Fig. 1. Causal network A: facilitating interpretations of symptoms experienced 24 h before competition. *Notes:* Arrows illustrate the relationship direction of the linked variables. Percentages represent the number of participants who reported experiencing the variable. Where two or more symptoms lead to an identical experience, the percentage is presented in **bold** face. Because of the direction of the relationship, the maps are best interpreted from left to right. ↑ = increased and ↓ = decreased.

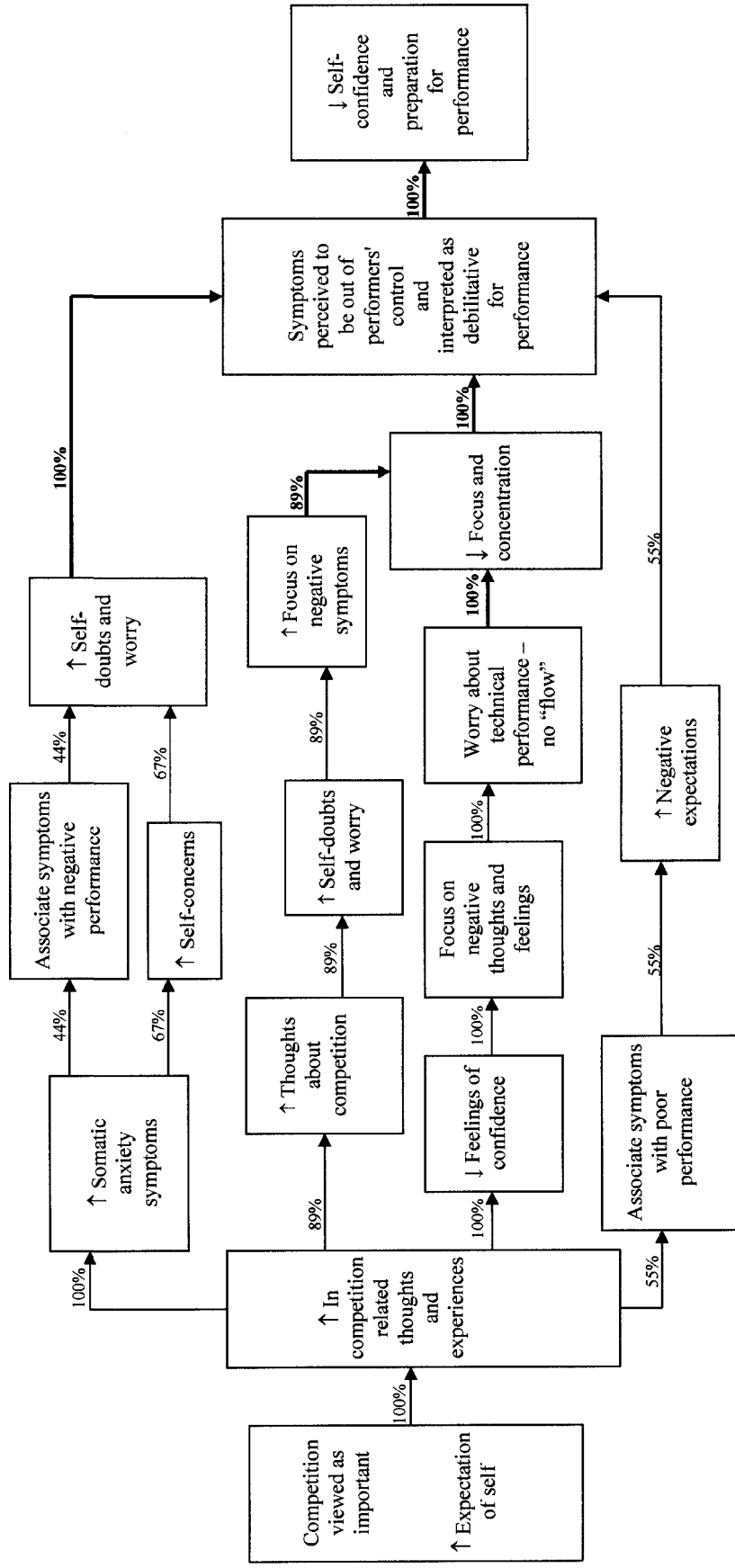


Fig. 2. Causal network B: debilitating interpretations of symptoms experienced 24 h before competition. *Notes:* Arrows illustrate the relationship direction of the linked variables. Percentages represent the number of participants who reported experiencing the variable. Where two or more symptoms lead to an identical experience, the percentage is presented in **bold** face. Because of the direction of the relationship, the maps are best interpreted from left to right. ↑ = increased and ↓ = decreased.

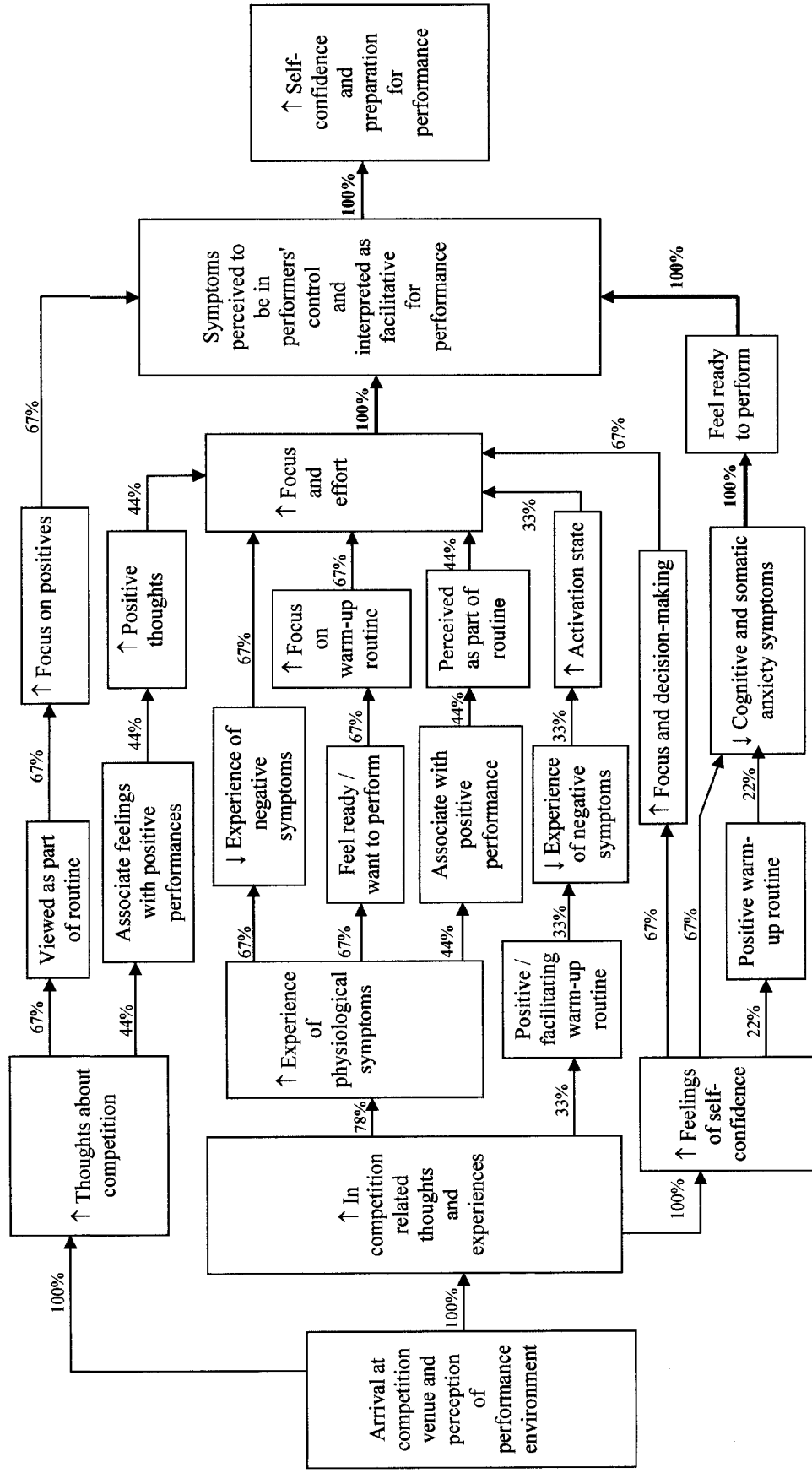


Fig. 3. Causal network C: facilitating interpretations of symptoms experienced 2 h before competition. *Notes:* Arrows illustrate the relationship direction of the linked variables. Percentages represent the number of participants who reported experiencing the variable. Where two or more symptoms lead to an identical experience, the percentage is presented in **bold** face. Because of the direction of the relationship, the maps are best interpreted from left to right. ↑ = increased and ↓ = decreased.

identified several reasons for the detrimental effect of an increase in competition-related symptoms (Fig. 4). First, an increase in overall symptoms was suggested to increase self-doubts (100%) and worry (11%) and cause performers to ruminate about the consequences of their actions (89%). This was deemed to lead to a reduced focus and effort towards preparation for performance. For example, 'If you think about racing too much then the doubts get in. "Can I perform today? Am I up for it? Am I good enough to qualify?" You worry about opponents . . . their times, how strong they are and what they are going to do . . . not your own race'.

Second, an increase in overall symptoms was perceived to increase negative somatic experiences (78%), contribute to a reduction in focus and effort (11%), reduce confident thoughts and result in further negative perceptions of competition preparation (67%). A final theme reported was the lack of experience of any competitive anxiety-related symptoms at this stage of preparation for competition (55%). Lack of symptoms was indicated to suggest that no personal meaning was attached to the competition or race (33%). This was believed to enhance worry and lead performers to feel that they were mentally and physically 'unprepared' for their performance. One performer claimed: 'If I don't get any nerves or worry or tingles . . . butterflies . . . that sort of thing . . . that can be just as bad . . . you begin to wonder why you aren't concerned . . . You don't seem to be bothered about the match . . . then I worry because I don't feel as though I am ready'.

Causal networks E and F: symptoms experienced 1 h directly before performance

Figures 5 and 6 present the cognitive and somatic symptoms experienced 1 h directly before performance. Similar to previous networks, the participants reported an increase in competition-related symptoms. However, this increase was believed to be a very intense cognitive and somatic experience represented by many thoughts, feelings and emotions. Antecedents suggested for the manifestation of these symptoms included the relative success of the completion of the participants' pre-performance routines (both physical and mental) and the subsequent perceived level of performance readiness.

Experience of competition-related symptoms within personal control, interpreted as being facilitative, leading to improved self-confidence and enhanced preparation for performance, were reported to derive from four main sources (Fig. 5). First, in addition to increased thoughts about competition leading to an increased focus on performance (33%), symptoms were also suggested to have the ability to increase self-doubts and worry (89%). However, performers reported this

experience as signifying readiness and preparation for performance. This was suggested to reduce any negative thoughts experienced (89%) and lead to a tendency not to dwell on such symptoms but to focus on performance instead (33%), thereby enhancing effort and concentration. The second source of positive interpretation of symptoms came from participants expressing that, if they perceived they were 'involved' in the race or competition, they would be able to block out any negative cognitive or somatic symptoms (55%). This was suggested to indicate to the participants that they were mentally and physically ready to perform. For example, one performer stated, 'If you feel like you are involved in the whole process of competition and preparation, you feel ready'. Increased physiological responses were reported to have the potential to debilitate preparation for performance if many somatic symptoms were experienced. Several participants indicated using mental skills such as self-talk and mental imagery to enhance focus and block out negative feelings (44%) to regulate and achieve appropriate levels of activation. For example, 'Sometimes you feel too tense in your legs or there is too much of that sick feeling. I try to see my race . . . swimming it the right way . . . I try harder to stay focused'.

The experience of competition-related thoughts in the presence of high self-confidence was thought by participants to enhance activation and induce a mental state of instinctive performance (55%), which lead to facilitating interpretations of symptoms for performing. Competition-related thoughts and concerns were also reported to be associated with good prior performances and used by individuals to reduce any negative competitive anxiety symptoms. This allowed the performer to achieve an appropriate mental focus (89%). A typical comment was, 'Just before . . . if you are confident . . . the thoughts . . . they are just all part of the final build up . . . they sharpen you up . . . you know that you are performing well and that helps prevent any negatives entering your preparation'.

Several explanations were provided for a loss of perceptions of control and debilitating interpretation of symptoms (Fig. 6). First, increases in cognitive symptoms were perceived to reduce focus and effort by causing the performer to have an 'over-negative' focus and employ irrational thinking and decision-making cognitions (89%). Second, cognitive symptoms were suggested to lead to an 'over-anxious' state that further contributed to irrational thought processes and an 'over-psyched' state (33%). Finally, increased worries about technical performance and feelings of a lack of 'flow' were also reported (89%). One performer suggested, 'When you get the negative thoughts in your mind, your preparation isn't natural . . . instead of just letting things happen you are thinking about aspects of

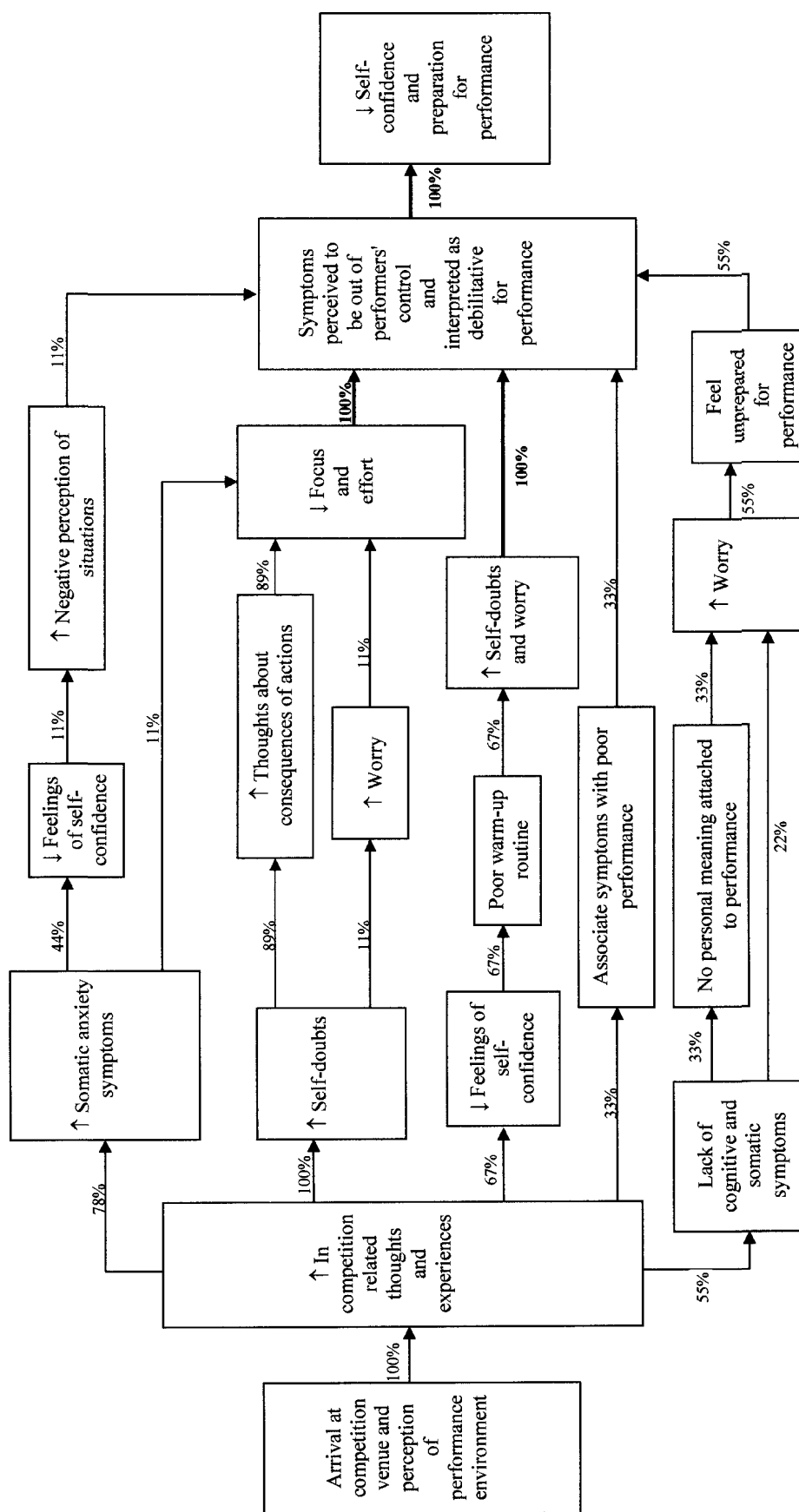


Fig. 4. Causal network D: debilitating interpretations of symptoms experienced 2 h before competition. *Notes:* Arrows illustrate the relationship direction of the linked variables. Percentages represent the number of participants who reported experiencing the variable. Where two or more symptoms lead to an identical experience, the percentage is presented in **bold** face. Because of the direction of the relationship, the maps are best interpreted from left to right. ↑ = increased and ↓ = decreased.

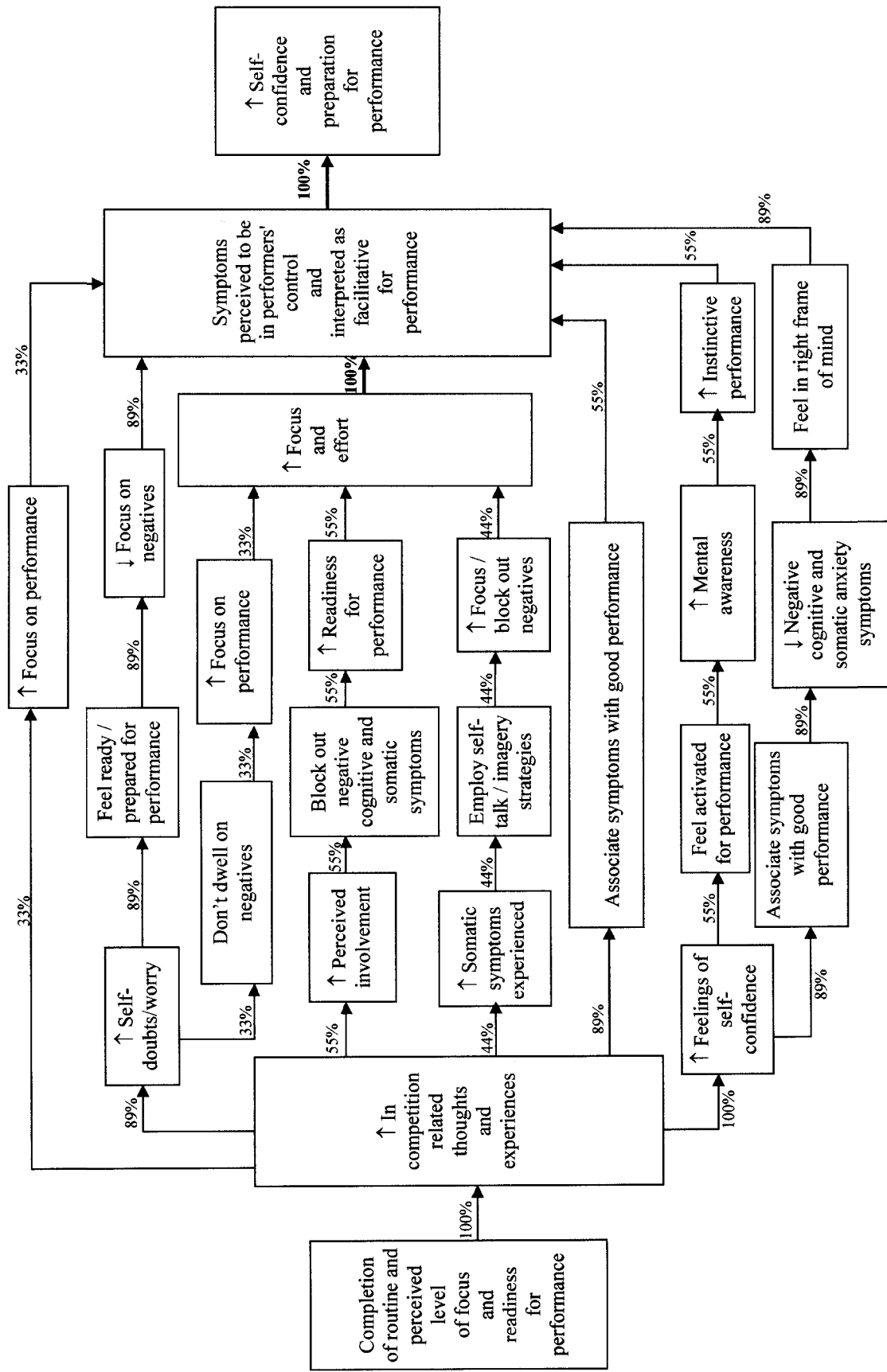


Fig. 5. Causal network E: facilitating interpretations of symptoms experienced 1 h directly before competition. *Notes:* Arrows illustrate the relationship direction of the linked variables. Percentages represent the number of participants who reported experiencing the variable. Where two or more symptoms lead to an identical experience, the percentage is presented in **bold** face. Because of the direction of the relationship, the maps are best interpreted from left to right. ↑ = increased and ↓ = decreased.

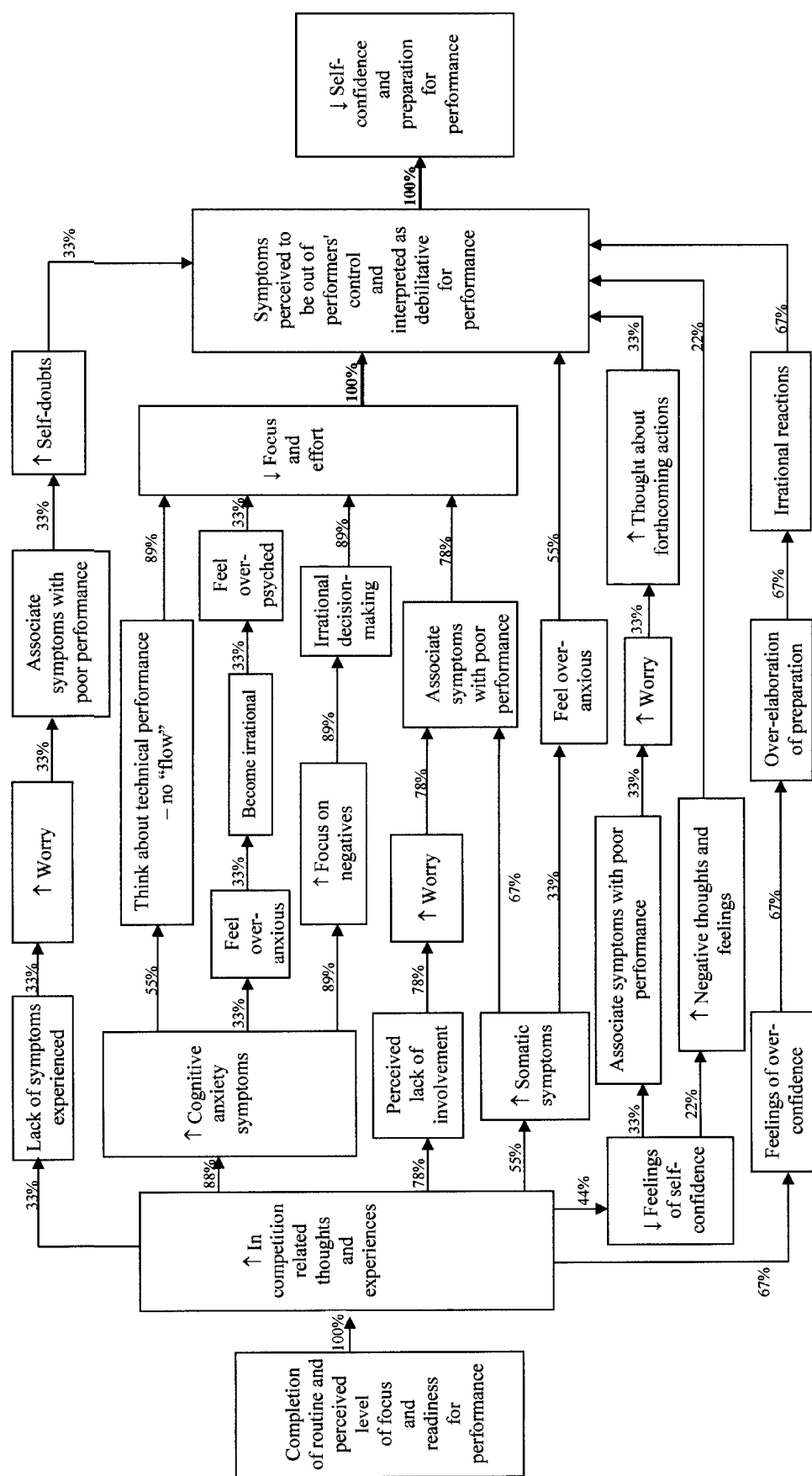


Fig. 6. Causal network F: debilitating interpretations of symptoms experienced 1 h directly before competition. *Notes:* Arrows illustrate the relationship direction of the linked variables. Percentages represent the number of participants who reported experiencing the variable. Where two or more symptoms lead to an identical experience, the percentage is presented in **bold** face. Because of the direction of the relationship, the maps are best interpreted from left to right. ↑ = increased and ↓ = decreased.

the race over and over in your mind . . . too analytical . . . there's no flow to your preparation'. Competition-related thoughts were also thought to be detrimental to preparation for performance if they signified to the participant a perceived lack of involvement in the following competition. This was suggested to increase worries about performance (78%) and to be associated with poor forthcoming performance, leading to a loss of focus and effort. As one performer stated, 'I feel almost mentally cold, even though I've warmed up . . . just not ready to perform, not part of the race or involved at all'.

Low self-confidence associated with thoughts about performance was suggested to make participants associate their symptoms with previous poor performance (33%). This contributed to negative thoughts and feelings (22%), an increased awareness of thoughts and actions and further perception of a loss of control over symptoms. Although a lack of self-confidence was reported to enhance cognitive worries and anxieties, the participants also suggested symptoms associated with 'over-confidence' could be negative for preparation for performance. Such over-confidence was perceived to lead to over-elaboration in pre-performance routines and cause irrational thinking or behaviours (67%). For example: 'I have been like that [over-confident] . . . It's very strange. You are not focused enough on your technique . . . you aren't thinking straight . . . your mind is elsewhere and you think strange thoughts and do strange things that are not part of your normal preparation routine'.

Discussion

The aim of this study was to examine elite athletes' retrospective perceptions and causal beliefs about temporal experiences of competitive anxiety and related symptoms in the time before competition. We identified performers' perceptions of the mechanisms by which symptoms associated with competitive anxiety were influenced in the build up to competition and how these symptoms affected preparation for performance. The findings would appear to support the existing theoretical predictions and empirical investigations regarding temporal patterning of the intensity and frequency of the anxiety response (Martens *et al.*, 1990; Swain and Jones, 1993). Specifically, intensity of cognitive anxiety symptoms was found to be predicted by performance expectations and perceptions of ability, and to remain relatively stable in the lead up to a competition, as long as expectations about performance remain stable (Jones *et al.*, 1990). Somatic anxiety intensity responses were also observed to remain relatively stable over the precompetitive period but to exhibit a sharp increase at the onset of performance.

This suggests that such symptoms are a conditioned response to the environmental stimuli associated with competition (Martens *et al.*, 1990). In line with the findings of Swain and Jones (1993), frequency of cognitive and somatic anxiety intrusions increased as the competition approached, from a relatively transitory state some 24 h before competition to one of a complex interaction of intense cognitive, affective and behavioural experiences directly before performing.

The results of this study also provide further evidence to confirm that self-confidence is a moderating variable in the interpretation of competitive anxiety direction and performance expectations (Bandura, 1982; Hanton and Connaughton, 2002). In addition, support is also provided for the control model of competitive anxiety (Jones, 1995; Jones and Hanton, 1996) and Eysenck and Calvo's (1992) processing efficiency theory. Specifically, across all temporal phases, increases in precompetitive symptoms combined with low self-confidence were reported to result in a loss of perceptions of control, problems with focus and concentration, and were viewed as debilitating or harmful to preparation for forthcoming performance. In contrast, increases in precompetitive symptoms accompanied by high self-confidence were perceived to enhance control of cognitions, and were viewed as facilitating to preparation for performance. An athlete who is confident of coping appears to respond to anxiety with renewed effort and attention (cf. Eysenck and Calvo, 1992), whereas those not confident of being able to cope are unlikely to persist in the face of anxiety symptoms and subsequently disengage (Carver and Scheier, 1988). Athletes who are high in self-confidence are, therefore, able to maintain facilitating perceptions of pre-performance symptoms through thoughts of 'confident coping' and increases in motivation and personal effort (Jones and Hanton, 2001).

Self-confidence is suggested to be a powerful construct in sport that has the ability to influence performance over and above the effect exerted by cognitive anxiety and physiological arousal (Hardy *et al.*, 1996) and to discriminate between anxiety interpretations (Jones *et al.*, 1994; Jones and Hanton, 2001; Hanton and Connaughton, 2002; Mellalieu *et al.*, in press). Despite these proposals, however, tentative explanations exist for the mechanism by which self-confidence protects against the harmful effects of debilitating competitive anxiety symptoms. Jones *et al.* (1994) suggested that elite athletes who experience symptoms associated with debilitating anxiety are able to maintain their self-confidence and a positive outlook towards performance by the use of effective cognitive strategies. S. Hanton, S.D. Mellalieu and R. Hall (unpublished) have recently provided support for these proposals, such that, in the presence of increasing physiological arousal and cogni-

tive anxiety symptoms, athletes use cognitive strategies, including thought-stopping, positive self-talk and mental rehearsal, to protect their self-confidence. These strategies function to remove, reduce or control any negative thoughts or images experienced, allowing a positive outlook towards symptoms experienced (i.e. confident coping). Assisted by enhanced effort and motivation, the athlete is able to maintain positive perceptions of control and subsequent facilitating interpretations of symptoms experienced about forthcoming performance. Support for these proposals is provided by the current study, in that protection against debilitating interpretations of symptoms associated with competitive anxiety was suggested to be maintained through implementation of a combination of cognitive-based confidence management strategies, including mental rehearsal, thought-stopping and positive self-talk. Further support for Hanton and co-workers' (unpublished) proposals was observed when cognitive strategies were described to serve a confidence protection function in that they reduced, removed or altered the negative 'doubting' cognitions the athlete is experiencing. It may be, therefore, that these cognitive strategies serve to alter the overall mental experience of the athlete from one of a negative state to a more positive confident outlook towards forthcoming competition and performance (Hanton and Jones, 1999a,b).

Although previous investigations examining anxiety direction (i.e. Wiggins, 1998) have reported no change in symptom interpretation in the time to event, we found changes across the temporal phases. This would appear to support recent work that has observed changes in patterns of interpretation of anxiety symptoms about preparation for performance and in relation to the impact on actual forthcoming performance (Mellalieu *et al.*, in press). In the study of Mellalieu *et al.*, many performers indicated anxiety symptoms experienced as facilitating for preparation but debilitating for actual performance. The authors suggested that the findings may be distinguishing between preparatory and performance anxiety experienced (cf. Burton, 1998). Symptoms associated with competitive anxiety experienced earlier in the temporal period are, therefore, perceived to be facilitative and preparatory for performance, while symptoms experienced directly before competing are viewed as being more debilitating. The current study appears to provide further support for these proposals, with 'changes' in symptom interpretation being particularly evident across the temporal phases 2 h before performance and directly before performing. Potential explanations as to why performers' direction interpretations change may be found in the changing appraisals of the antecedents of the particular temporal phases that cause the increase in competition-related thoughts and feelings (Cerin *et al.*, 2000). Also

worthy of consideration is the fact that symptom interpretation appears to be affected by the self-confidence experienced and the use of mental skills to sustain or protect self-confidence (Hanton *et al.*, unpublished). Clearly, there may be certain temporal phases when athletes are more effective at implementing cognitive strategies to sustain confidence and subsequent facilitating interpretations. Given that the stress process has been highlighted in the current study as being very dynamic in nature, further investigation is clearly warranted, in particular consideration of the changes that may occur over time in interrelated variables such as emotions, appraisal and coping strategies (cf. Cerin *et al.*, 2000).

Although the current findings highlight advances in the understanding of the nature of the temporal patterning of symptoms associated with competitive anxiety, interpreting the findings must be done with caution because of the retrospective nature of participants' responses. Researchers should be cognisant of the potential for memory distortion and the contamination of affective responses by cognitive judgements. There is, however, considerable evidence in the literature examining eyewitness memory accounts to support the use of retrospective recall methods. Studies of real-life events appear to suggest that highly emotional or arousal-inducing events (such as that of major competitions or matches) are well retained over time, especially with respect to detailed information directly associated with the event (e.g. Christianson, 1992). More detailed discussions of retrospective recall in sport and exercise can be found elsewhere (i.e. Rychta, 1982; Brewer *et al.*, 1991). In the present study, every attempt was made to establish a consistent retrospective period and maximize information recall through the use of a standardized questioning framework. This procedure was tested in a pilot study in which participants verified that no memory problems were experienced with the interview protocol.

A further limitation of the present study is that participants were interviewed from different sports. Evidence suggests that sport type may mediate interpretations of the competitive anxiety response (i.e. Hanton *et al.*, 2000). However, when considering the sampling procedure, we felt that participants should be selected because they were information-rich and illuminative cases that would offer useful manifestations of the phenomena of interest (Patton, 2002). As no study has investigated whether differences in interpretation occur across the time to event paradigm, we felt that it was more important to gain insight about the phenomenon rather than attempt to classify or generalize from the findings. Clearly, more studies are required to pursue these and other potential variables that may affect the homogeneity of the sample,

including personality dispositions such as perfectionism (Hall *et al.*, 1998) and trait anxiety (Hanton *et al.*, in press).

Although direct causality cannot be inferred from a study using a design of this nature, the findings show how the specific variables of anxiety direction and self-confidence can interact in a relatively stable manner, or be more transitory and fluctuate across the precompetition period and during actual performance. As this type of research design is relatively new for examining the temporal patterning relationship, future studies should adopt a qualitative perspective to examine the nature of anxiety interpretation and the changes that occur across such time phases. The current study was also limited in that changes in symptoms were only examined across three time periods. It should also be noted that the intended time phase of 48 h before the event was not considered important to preparation by the participants in the pilot or the main study and was subsequently removed from the analysis. More attention should be devoted, therefore, to the examination of variables that have been shown to influence the nature of individual performers' appraisals across more sensitive time phases (Cerin *et al.*, 2000) and which are considered to be more meaningful to preparation for performance and performance itself.

In focusing upon the qualitative aspects of the competitive anxiety response across a temporal context, many other affective states were discussed and highlighted by the participants beyond those of symptoms associated with competitive anxiety. Hanin (1997, 2000) and others have demonstrated the role that other affective states appear to play in the pre-performance experience. Future studies should, therefore, consider designs that incorporate the idiosyncratic nature of the pre-performance mental state and assess the range of cognitive, affective and behavioural experiences observed to occur in elite athletes in the lead up to competition, rather than focus exclusively on the anxiety component of the stress process. In highlighting that the nature of the performer's appraisals change over time, alternative brief measures of anxiety and affect are required that can validly and reliably monitor changes in these appraisals and experiences (cf. Thomas *et al.*, in press). Such brief measures would allow more frequent collection of data and be less invasive, thereby avoiding the ethical concerns of intruding into the performer's preparation routine that are associated with traditional longer psychometric measures of anxiety (Mellalieu *et al.*, in press).

Finally, in examining the nature of the competitive anxiety response, further empirical examination of Jones' (1995) model of control is required. Jones' (1995) model predicts that performers who perceive themselves to be able to cope with their anxiety and to

achieve their goals are able to interpret their anxiety symptoms as being facilitative to performance. Those perceiving themselves not to be in control and possessing negative expectancies regarding goal attainment are predicted to interpret symptoms as being debilitating to performance. The current findings provide partial support for the model in that perceptions of control and self-confidence have been shown to moderate anxiety interpretation (Hanton and Connaughton, 2002; Hanton *et al.*, unpublished), yet the interaction of such variables with goal attainment expectancies has not been examined. Jones and Hanton (1996) have provided support for this part of the model by examining the debilitating and facilitative dimensions of anxiety as a function of goal type. However, these authors suggested that future research should determine if perceptions of control over goal attainment differ as a function of other individual difference variables such as skill (Jones *et al.*, 1994) and the nature of the sporting environment (Hanton *et al.*, 2000). In addition, although little empirical evidence exists about the direct relationship between control perceptions and athletic performance, behavioural, affective and physiological consequences are suggested to be influenced as a function of locus of control beliefs (cf. Ntoumanis and Jones, 1998). The underlying mechanisms for this process are also worthy of further consideration.

From an applied perspective, the present findings suggest that analysis of an individual's precompetitive temporal patterning response is important to identify a clear understanding of *what* is happening and *why* it is happening. This provides a stronger rationale for the psychologist to intervene with the performer to implement intentional and planned change (Cerin *et al.*, 2000). The idiosyncratic nature of the temporal patterning response highlights in particular the need for intra-individual assessment and intervention (Hanin, 1997). For example, the current findings show that the experience of anxiety symptoms is not necessarily debilitating to performance. Thoughts and feelings that are viewed as being negative can, under certain conditions (i.e. perceived personal control and high self-confidence), have a facilitative effect upon performance. Cognitive confidence-building and protection strategies should, therefore, be developed to assist performers to cope with any negative symptoms experienced. This will allow performers to develop positive perceptions of control and subsequent facilitating interpretations towards preparation for performance. We have also shown that changes in the appraisal of the antecedents of the symptoms associated with competitive anxiety may lead to changes in directional interpretations about preparation for performance. The sport psychologist should, therefore, work to modify the performer's appraisal of the antecedents that lead specifically to

negative or debilitating interpretations of symptom intensity throughout the precompetition period.

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