

# Advanced Psychological Strategies and Anxiety Responses in Sport

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This study examined the use of four advanced psychological strategies (i.e., simulation training, cognitive restructuring, preperformance routines, and overlearning of skills) and subsequent competitive anxiety responses. Semistructured interviews were employed with eight highly elite athletes from a number of team and individual sports. Participants reported using each strategy to enable them to interpret their anxiety-response as facilitative to performance. Only cognitive restructuring and overlearning of skills were perceived by the participants to exert an influence over the intensity of cognitive symptoms experienced. The perceived causal mechanisms responsible for these effects included heightened attentional focus, increased effort and motivation, and perceived control over anxiety-related symptoms. These findings have implications for the practice of sport psychology with athletes debilitated by competitive anxiety in stressful situations.

The area of competitive anxiety continues to attract a considerable amount of research attention in the discipline of sport psychology (Hanton, Neil, & Mellalieu, 2008; Mellalieu, Hanton, & Fletcher, 2006). Traditionally, researchers studied the intensity (i.e., the amount or level) of competitive anxiety and its associated cognitive and somatic symptoms to predict and/or explain variance in performance (e.g., Martens, Burton, Vealey, Bump, & Smith, 1990). However, the development and expansion of anxiety research has generated other dimensions that warrant attention. One dimension that has become the focal point of a substantial body of research is the notion of *direction*, which refers to the extent with which the intensity of symptoms associated with competitive anxiety are interpreted as having either positive or negative effects upon performance on a facilitative-debilitative continuum (Jones, 1995). Alongside researchers observing that anxiety-related symptoms can be further appraised, interpreted and ultimately labeled as facilitative to performance (e.g., Hanton & Connaughton, 2002; Perry

& Williams, 1998), a number of personal and situational characteristics that influence this cognitive evaluative process have also been uncovered (cf. Hanton et al., 2008; Mellalieu et al., 2006).

Of the many individual difference variables under examination, a number of studies have attempted to evaluate the use of basic psychological skills (e.g., goal-setting, imagery, relaxation, and self-talk) upon the competitive anxiety response (e.g., Fletcher & Hanton, 2001; Neil, Mellalieu, & Hanton, 2006; Page, Sime, & Nordell, 1999). Taken together, these studies suggest that nonelite athletes primarily use relaxation strategies to lower the intensity of symptoms to interpret them as facilitative to performance; whereas, elite performers maintain their intensity levels and use a number of basic psychological skills (i.e., goal-setting, imagery, and self-talk) to interpret their anxiety-response as facilitative to performance. Despite the application of these findings to the practice of sport psychology with elite and nonelite populations, they fail to capture the causal mechanisms that underlie the relationship between the use of basic psychological skills and competitive anxiety responses.

Wadey and Hanton (2008) have recently extended these preliminary findings by using qualitative methods of inquiry to uncover the perceived underlying mechanisms by which goal-setting, imagery, relaxation, and self-talk influence precompetitive anxiety responses. Their findings revealed that basic psychological skills operated through various mechanisms, including heightened attentional focus, increased effort and motivation, and perceived control over anxiety-related symptoms, which enabled the participants to interpret their anxiety-response as facilitative to performance. Although these findings had conceptual and practical significance, the authors acknowledged their results were limited in that they only explored the independent effects of each psychological skill. Indeed, Hardy, Jones, and Gould (1996) illustrated that athletes, coaches, and applied sport psychologists often combine basic psychological skills with other component parts (i.e., other mental and/or physical skills) to create more advanced psychological strategies. To elaborate, psychological skills can either be used on their own as *basic* psychological skills (such as imagery or self-talk) or as subcomponents of *advanced* psychological strategies (such as cognitive restructuring that often combines imagery and self-talk).

A number of advanced psychological strategies have been reported throughout the sport psychology literature (e.g., Hanton & Jones, 1999; Thomas, Maynard, & Hanton, 2007). Considering the nature of this study this review will exclusively draw upon four advanced strategies that previous empirical research has either directly or indirectly related to anxiety responses in sport. First, *Simulation Training* is where athletes simulate as many external (e.g., competitive demands such as crowd noise and competitive rivals) and internal (e.g., strain reactions such as anger and competitive anxiety) conditions associated with performing in a competitive event or match, which usually are not present to the same degree, or even at all, in the training environment (Hardy et al., 1996). The aim of this advanced psychological strategy is to physically and mentally simulate the competitive environment as closely as possible so that athletes can practice and learn to perform successfully under such stressful conditions. For instance, Jones (1993) demonstrated how the psychological benefits of simulation training could be successfully transferred into the competitive environment by using mental imagery

and physical practice in the presence of stressors (i.e., poor officiating) to help an elite racket sport player cope with demanding situations that arise during competition. Second, *Cognitive Restructuring* is a cognitive-behavioral intervention that is based on the underlying premise that cognitions are central to predicting and/or explaining behavioral responses (Mace, 1990). The aim of this advanced psychological strategy is to enhance performance by replacing irrational thought patterns with more adaptive cognitions. For instance, Thomas et al. (2007) assessed the efficacy of such an intervention on a sample of elite field hockey players debilitated by competitive anxiety. Their findings showed no changes in the intensity of symptoms but a successful transformation from debilitating to facilitative directional interpretations. Improvements in self-confidence and performance were also observed. Third, *Preperformance Routines*, which typically comprise of individualized and systematic cognitive and behavioral strategies that are carried out before performance (Boutcher, 1990). Specifically, in the current study this strategy refers to the routines used approximately one hour before performance, which previous research has not only shown to enhance self-confidence and help maintain facilitative directional interpretations (e.g., Hanton & Jones, 1999; Hays, Maynard, Thomas, & Bawden, 2007), but also to positively impact on sporting performance (e.g., Lonsdale & Tam, 2008). The last advanced psychological strategy, *Overlearning of Skills*, is where athletes repeatedly execute the physical and mental skills that they are going to reproduce in competition (Hardy et al., 1996). Associated literature has identified this strategy to have important psychological benefits for competitive athletes (e.g., Connaughton, Wadey, Hanton, & Jones, 2008; Hays et al., 2007). For instance, Hays et al. (2007) reported that overlearning of skills was a salient source of self-confidence in world-class sporting performers. Considering, therefore, that self-confidence has been suggested to be one of the most significant factors in discriminating how athletes interpret their anxiety response in relation to performance (Hanton, Mellalieu, & Hall, 2004; Hardy et al., 1996), this strategy may have an important influence upon athletes' experiences of precompetitive anxiety symptoms.

Although the preceding discourse has provided tentative alliances between the use of advanced psychological strategies and certain dimensions of the anxiety response, it is difficult to reach any definitive conclusions from the existing evidence for three reasons: (a) examining advanced psychological strategies was not the central aim of the studies reported (e.g., Connaughton et al., 2008), (b) no inference was made to competitive anxiety (e.g., Hays et al., 2007), and/or (c) the intervening mechanisms that underlie the purported effects were not disclosed (e.g., Lonsdale & Tam, 2008). Consistent with recommendations for future research (e.g., Fletcher & Hanton, 2001; Wadey & Hanton, 2008), these observations highlight the value in providing a more detailed insight into these relationships to inform coaches and consultants working with athletes debilitated by competitive anxiety. The aim of this study was twofold: (1) to examine the perceived effect of certain advanced psychological strategies on the intensity and direction dimensions of competitive anxiety one hour before competition; and, (2) to examine, where applicable, the perceived causal reasons through which these strategies influence the experience of anxiety-related symptoms.

## Method

### Participants

Following a three-step participant selection criteria (see procedure section), eight elite performers (3 females and 5 males;  $M$  age = 23.3,  $SD$  = 2.8) from a National Sports Institute within the United Kingdom were invited to participate in this study. All agreed and written informed consent was obtained in line with the lead author's university ethical research guidelines. Participants represented a range of team and individual sports (i.e., athletics, badminton, basketball, rhythmic gymnastics, soccer, rowing, rugby union, and trampolining) and had an average of five years of international experience. Each participant was also assessed for previous exposure to sport psychology support. All participants reported having had between four-to-nine group presentations and/or one-to-one sessions from an Accredited or Certified practicing sport psychology consultant.

### Measures

The Test of Performance Strategies (TOPS; Thomas, Murphy, & Hardy, 1999) is a self-report instrument designed to measure the psychological skills and strategies used by athletes in competition and during practice. The measure is comprised of eight competition subscales and eight practice subscales, each consisting of four items. For the purposes of this study only four competition subscales were used: goal-setting, imagery, relaxation, and self-talk. Participants rated the frequency of each item on a scale anchored by 1 (*never*) to 5 (*always*), with overall usage scores ranging from 4 to 20. Cronbach's alpha coefficients of .78 for goal-setting, .79 for imagery, .80 for self-talk, and .80 for relaxation have been reported (Thomas et al., 1999).

### Preparation Booklet

A preparation booklet consisting of an introduction to the study, an overview of the structure and content of the interview guide, an educational section, and tasks to enhance recall in the interview setting was developed for the purposes of this study. The rationale to include an educational section was to help the participants to recognize, distinguish, and accurately report the symptoms and dimensions associated with competitive anxiety (Thomas, Hanton, & Jones, 2002). Specifically, this section was made-up of "athlete-friendly" definitions of cognitive anxiety, somatic anxiety, self-confidence, intensity, and directional interpretations that were drawn from Thomas et al.'s (2002) Immediate Anxiety Measures Scale (IAMS). For example, cognitive anxiety was defined as, "the mental component of anxiety and may be characterized by thoughts such as concerns or worries about your upcoming competition, for example about the way you perform or the importance of the event" (p. 329). The participants then completed a series of tasks which focused on (a) their usual anxiety response one hour prior to competition (a time scale consistent with previous research; Fletcher & Hanton, 2001), (b) their use of these advanced psychological strategies (i.e., *what*, *where* and *when*),

and (c) whether using these strategies influenced their precompetitive anxiety response.

## Interview Guide

A semistructured interview guide was used to facilitate the interview process and to develop pointers for further discussion during the interview. Specifically, the structure of the guide and questions emanated from reviewing interview guides from previous studies (e.g., Gould, Dieffenbach, & Moffett, 2002; Hanton & Connaughton, 2002), whereas the content of the questions was generated from taking into consideration the relevant literature (e.g., Hardy et al., 1996; Mellalieu et al., 2006). The initial draft of the interview guide was piloted with two elite athletes and feedback about its structure and content was derived from the interviewees themselves and an experienced qualitative researcher who reviewed the interview transcripts. This evaluative process resulted in minor refinements being made to the question narrative and phrasing to ensure clarity and comprehensiveness.

The resultant interview guide consisted of six sections. Section 1 provided the participants with the aims of the interview guide and assured confidentiality and anonymity. Sections 2 to 5 focused on the use of each advanced psychological strategy. Specifically, each section (re)examined the participants' usual precompetitive anxiety response (and, if applicable, what specific symptoms led to the use or recall of each strategy before competition), the explicit use of each advanced psychological strategy, and whether their use influenced the experience of precompetitive symptoms. For example, "What physical feelings do you usually experience approximately an hour prior to competition?" and "Does the use of cognitive restructuring influence the amount [intensity] of worrisome thoughts you usually experience approximately an hour prior to competition?" Probes were also used to clarify any points that were unclear and to elicit a more in-depth response (Patton, 2002). If a relationship was reported by the participants a further subset of questions was then employed to probe the perceived mechanisms that underpinned these purported effects. Consistent with empirical research exploring competitive anxiety (Hanton & Connaughton, 2002; Hanton et al., 2004), the participants were also asked within these sections about the resultant impact upon subsequent levels of self-confidence and performance. Throughout Sections 2 to 5 it was also continually emphasized to the participants that this study was only interested in the combined rather than independent effects of the subcomponents that constitute each advanced strategy. Finally, Section 6 concluded the interview and invited the participants to raise any comments.

## Procedure

**Participant Selection Criteria.** A three-step procedure was implemented to purposively select participants that would successfully illuminate the issues of central importance to the research question (Patton, 2002). First, elite athletes were sought because they have been identified to effectively use advanced psychological strategies (Connaughton et al., 2008; Jones, Hanton, & Connaughton, 2007). Criteria for elite status was based on the classification that individuals had attained full international honours and represented their country in major sporting events (e.g.,

Olympics or Commonwealth Games; Hanton & Connaughton, 2002). Thirty-three elite athletes were contacted and informed of the nature of the study. Second, considering that advanced strategies often consist of, among other things, basic psychological skills, the 33 potential participants were screened for goal-setting, imagery, relaxation, and self-talk use by completing the respective subscales from the TOPS inventory (Thomas et al., 1999). Consistent with previous research (Wadey & Hanton, in press), a criterion score of 15 was set for all four subscales to establish high usage. From the 33 elite athletes identified, only 19 were found to score between 15 and 20 for each of the four competition subscales. The other 14 athletes took no further part in this study. Finally, the remaining 19 elite athletes were contacted and given an informal follow-up interview to verify their TOPS scores and to determine whether they frequently used the four advanced psychological strategies under examination. Specifically, this discussion with each potential participant was guided by a standardized list of questions, together with illustrative examples of the typical use of each advanced psychological strategy. These follow-up interviews revealed that only eight from those 19 elite athletes used all four advanced strategies in this study, as well as reporting high usage of basic psychological skills (i.e., goal-setting [ $M = 17.9$ ,  $SD = 0.6$ ], imagery [ $M = 17.5$ ,  $SD = 0.9$ ], self-talk [ $M = 18.9$ ,  $SD = 0.6$ ], and relaxation [ $M = 17.1$ ,  $SD = 1.5$ ]). The other 11 athletes took no further part in the study.

**Interview.** Each participant was sent a copy of their preparation booklet one week before their interview. All interviews were conducted face-to-face by the same researcher who was trained in qualitative techniques. The interviewer was also an experienced former competitive athlete, which allowed for greater empathy with the participants and an ability to converse in the specific terminologies and idiosyncrasies associated with competitive sport. Each interview lasted between 90–120 min and collectively yielded over 600 typed pages. All interviews were recorded in entirety and transcribed verbatim.

## Data Analysis

Causal networks were used to analyze and display the data elicited (Miles & Huberman, 1994). Specifically, they provide a visual representation of the variables in an investigation (shown in boxes) and the relationships among them (shown by arrows). Each causal network is further accompanied by descriptive text in the form of direct quotations to describe the meaning of the relationships between the variables. This method of analysis was adopted because it had proven successful in previous research to uncover and illustrate the perceived mechanisms underlying phenomena (e.g., Hanton & Connaughton, 2002).

Consistent with previous procedures (Wadey & Hanton, in 2008) and recommendations (Miles & Huberman, 1994), seven sequential stages of data analysis were used. First, participants verified the content of their interview transcripts (Lincoln & Guba, 1985). Second, the authors studied the transcripts to ensure content familiarity. Third, the authors independently and then collectively identified streams (i.e., unbroken chains of variables) in the form of raw quotations from each of the interview transcripts. For instance, “When I experience doubts about my performance, I turn them into something positive to help me better

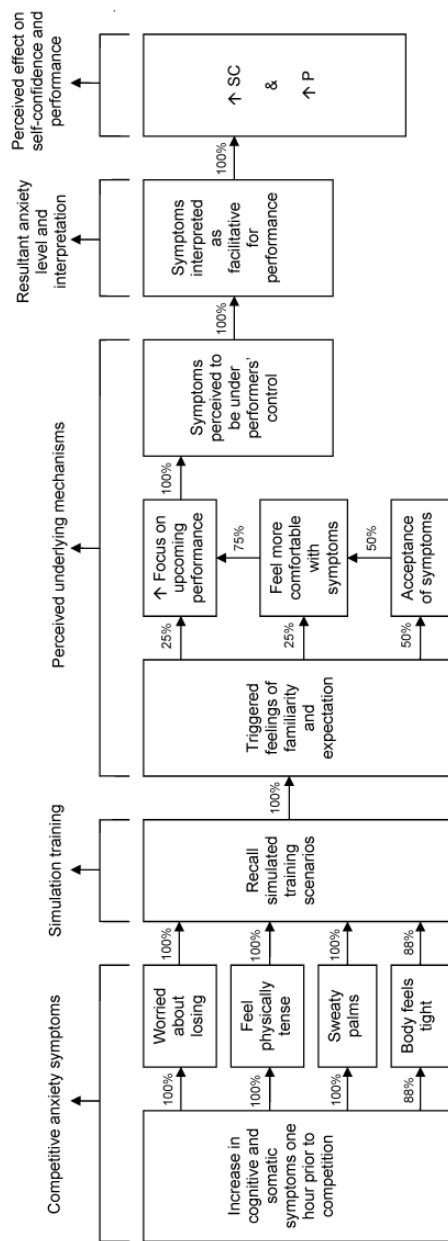
prepare for the game ahead.” Fourth, the authors generated a causal network variable list for each participant to code their responses for each advanced psychological strategy. Specifically, each variable list contained five columns: (a) competitive anxiety symptoms, (b) the advanced psychological strategy, (c) perceived underlying mechanisms, (d) resultant anxiety level and interpretation, and (e) perceived effect on self-confidence and performance. Fifth, each participant’s variable list was then visually displayed in a coherent causal network by successfully transferring the raw quotations under each of the five columns into boxes and using arrows to identify the perceived directional relationship. Sixth, the respective causal networks were then sent to each participant to confirm that the authors’ interpretations were an accurate representation of their accounts (Lincoln & Guba, 1985). All the participants confirmed that the results accurately reflected their preperformance experiences. Finally, combined causal networks were created for each advanced psychological strategy and the frequency of all participants’ responses recorded.

## Results

The findings are illustrated by four causal networks that represent each advanced psychological strategy (see Figures 1–4). Each network consists of two major elements: (a) a set of variables linked together by a series of arrows illustrating the relationship direction, and (b) for each of the variables a percentage of the number of participants who identified each element. The data within each network is further displayed under five headings: (1) competitive anxiety symptoms (and what specific symptoms resulted in the use or recall of each advanced psychological strategy), (2) the advanced psychological strategy, (3) perceived underlying mechanisms, (4) resultant anxiety level and interpretation, and (5) perceived effect on self-confidence and performance. Due to the direction of the relationship, the reader is encouraged to follow the causal networks from left to right. Finally, descriptive summaries and verbatim quotations accompany each causal network to further illuminate the findings.

### Causal Network 1: Simulation Training

Figure 1 illustrates how simulation training was perceived by the participants to influence their directional interpretations of competition anxiety one hour before competition. All the participants reported using and being involved in training sessions that simulated competition through a combination of two main mediums: mental rehearsal and physical practice. Specifically, they imagined and trained in the presence of stressors associated primarily and directly with competition (e.g., poor officiating, competitive rivals, crowd noise, and adverse weather conditions), which brought about thoughts and feelings associated with their usual anxiety response. For example, participants reported that in training they would hold ‘mock’ competitions, prime referees to make bad calls, play crowd-noise over the tannoy, use teammates to intentionally try to disrupt their concentration, and travel abroad to practice in hot and humid-weather conditions and/or turn on the sprinklers before training to practice in wet-weather conditions. At the same time the performers would also imagine themselves successfully coping with, and thriving



**Figure 1** — Causal network 1: The effects of simulation training upon the intensity and interpretation of symptoms associated with competitive anxiety. Arrows illustrate the relationship direction of the linked variables. Percentages represent the number of participants reporting experiencing the variable. Due to the direction of the relationship, maps are best interpreted from left to right. ↓ = Decreased and ↑ = Increased. SC = Self-Confidence and P = Performance.

upon, these stressors and subsequent strain reactions. One participant commented, "Nothing can truly simulate competition. But my coach does always put me in training situations where I'm competitive with someone of the same ability, which brings on feelings of pressure and anxiety." The participants also reported using mental imagery alongside this physical practice, "I try to increase my nervousness in training by imagining I'm playing against my biggest rival." Although this advanced psychological strategy was used within the training environment, the participants reported that when they experienced the stressors and strains they had physically and mentally simulated during an actual competitive event it would cause them to recall the use of this advanced strategy.

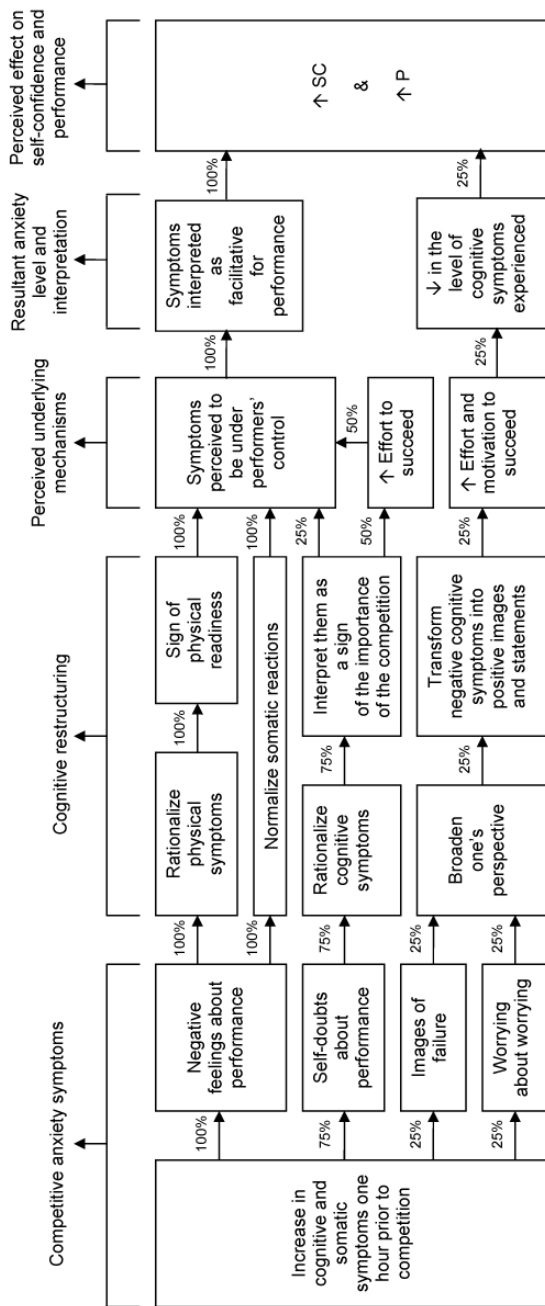
None of the participants reported that they used simulation training to lower or eliminate their precompetitive cognitive and somatic symptoms. For instance, "It [simulation training] doesn't reduce any worries I have before the race. I mean, by doing things like this, we are trying to recreate the worries and nerves so we can use them to our advantage." However, this strategy was expressed by the participants to bring their anxiety-response under their control. One category of reasoning emerged to explain this relationship. Specifically, it was expressed by all the participants that certain cognitive ("worried about losing," 100%) and somatic ("sweaty palms," 100%) symptoms caused them to recall simulated training scenarios, which triggered "feelings of familiarity and expectation" (100%). One athlete commented, "I rehearse every possible eventuality. Then when I get to competition I know exactly what to expect. I already know that I will get nervous. Nothing can faze me; I'm in full control."

These feelings of familiarity and expectation were then reported by certain participants (50%) to enable them to accept the thoughts and feelings they usually experience before competition. One athlete reported, "When you expect certain things to happen, like getting nervous, you're more willing to accept it rather than getting overly worked up about it." Some of the participants then expressed the opinion that these causal mechanisms allowed them to feel more comfortable in the presence of their symptoms, which enabled them to increase their focus on their upcoming competition. One participant commented, "By accepting that I'm going to get nervous, it definitely helps me feel more comfortable. And because I'm more at ease, I'm able to focus on what I'm supposed to be focusing on . . . the competition." This advanced psychological strategy was then ultimately reported by all the participants to lead to facilitative directional interpretations, feelings of self-confidence and an optimistic outlook on their imminent performance. One participant stated:

It [simulation training] really helps me to prepare for competition . . . Then when I am at competition, it's a familiar feeling, like I've been there before . . . Yeah, I still get nervous, don't get me wrong, you always need some nerves to perform well. But, because I know it's coming, I'm in control. And if you're in control you will perform better.

## Causal Network 2: Cognitive Restructuring

Figure 2 depicts the perceived mechanisms through which cognitive restructuring was reported to influence the intensity and direction dimensions of competitive



**Figure 2** — Causal network 2: The effects of cognitive restructuring upon the intensity and interpretation of symptoms associated with competitive anxiety. Arrows illustrate the relationship direction of the linked variables. Percentages represent the number of participants reporting experiencing the variable. Due to the direction of the relationship, maps are best interpreted from left to right. ↓ = Decreased and ↑ = Increased. SC = Self-Confidence and P = Performance.

anxiety. All the participants reported that they developed their ability to cognitively restructure their thoughts and feelings through receiving sport psychology support and gaining competitive experience throughout their sporting careers. It was also reported that they would mostly use this advanced psychological strategy during the precompetitive period. Two athletes provided the following comments, "I try and turn everything into a positive. I don't want anything holding me back" and "I change any negative thoughts immediately, because the less time you have thinking negatively the better." This strategy was reported by the participants to be used at various times before competition and in a number of different settings (e.g., in the locker room, during the warm up, and/or away from the competitive arena). One participant stated:

Every athlete experiences some negative thoughts . . . especially during the lead up to an important competition. But, you never really know when a negative thought is going to creep in . . . What's important though, is that when it does you know how to use it to your advantage to help your performance.

Cognitive restructuring was perceived by some participants to influence the intensity of certain irrational cognitive symptoms experienced one hour before competition (i.e., "images of failure," 25% and "worrying about worrying," 25%). One perceived causal reason was provided that illustrated how this strategy would transform these worrisome concerns into more adaptive thought patterns. Specifically, certain participants (25%) reported that they would firstly broaden their perspective by drawing upon personal nonsporting events (e.g., the death or serious illness of a close family member). Consequently, this enabled them to introduce positive statements and images of previous sporting accomplishments. One participant provided the following example:

Sometimes I do doubt myself too much when I don't really need to . . . I've done the training, done well in previous meets, and in reality I have as good a chance as anyone, if not better . . . To change them [doubts] into something more positive, I try and put things in perspective. I remind myself about the difficult times I've had outside of sport . . . I mean it is just a race . . . I also keep telling myself about positive things I've done in sport . . . It doesn't take long to change them . . . [which] helps boost my confidence leading into the race.

A heightened level of "effort and motivation to succeed" (25%) was reported by the participants thereafter, which lowered the intensity of these irrational symptoms and brought about feelings of self-confidence and a perception that they would perform successfully. However, it is important to highlight that cognitive restructuring was not reported by the participants to influence the intensity of all their cognitive symptoms before competition. One athlete provided the following account, "You'll never remove all the worries. As if you didn't feel nervous you would be relaxed like you didn't care." However, consistent with their somatic reactions ("negative feelings about performance," 100%), any remaining cognitive symptoms ("self-doubts about performance," 75%) were reported by the participants to be under their control through using this advanced psychological strategy. Two explanations were provided to explain this perceived relationship. First,

experienced cognitive symptoms were reasoned with and interpreted as a, “sign of the importance of the competition” (75%), which for some athletes (50%) heightened their perceived efforts levels before performance, “I just emphasize that it’s an important game. That’s why I’m thinking like this. . . . If anything, they [cognitive symptoms] just help to motivate me before getting on the court.” Second, somatic symptoms were normalized (100%) and rationalized as a sign of readiness (100%). One athlete reported, “I tell myself that everyone feels this way and it’s just part of competition.” Another participant expressed, “I see them [somatic symptoms] as a sign that I am ready to perform because I always get those feelings before competing.”

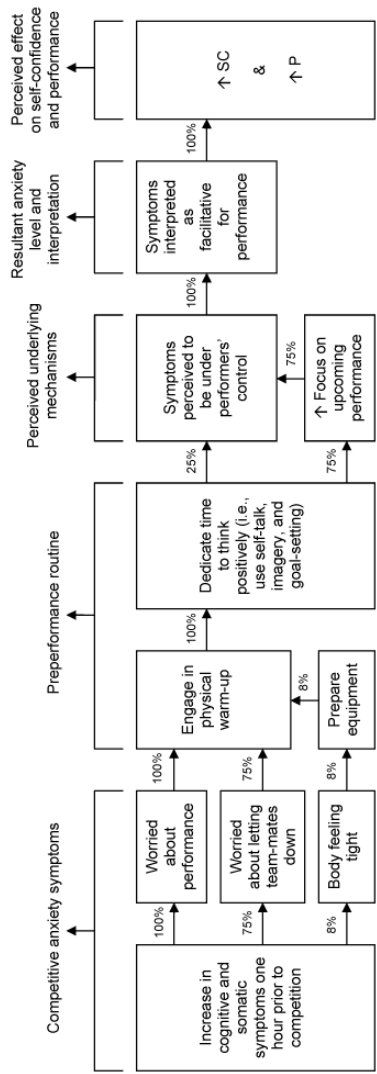
The aforementioned perceived mechanisms were then ultimately expressed by all the participants to lead to facilitative directional interpretations and feelings of self-confidence, which were used as a stimulant toward the forthcoming competition. For instance, “It [cognitive restructuring] just helps you see your nervousness in a different light. It’s still there, but you see it as something positive for performance rather than negative.” Another athlete commented, “Once the battle in my head is under control, I feel more confident as I know the nerves will help my performance. And the more confident you are, the more likely you will perform better.”

### **Causal Network 3: Preperformance Routines**

Figure 3 illustrates the perceived effects of preperformance routines upon the interpretation of anxiety-related symptoms one hour before competition. The participants reported that they developed their preperformance routines with their team-mates, coaches, and/or by themselves, and that they were initiated when they arrived at the competitive venue. Although the specific duration and content of the preperformance routines did vary between each participant, the sequential ordering of the main phases appeared relatively consistent before competition. Indeed, all the participants reported initially spending time physically warming-up (and, if applicable, preparing their equipment for competition), and then making a conscious decision to use a combination of mental strategies to help them psychologically prepare for competition. One athlete provided the following example:

I arrive at the court about an hour or so before the game. I quickly get changed and spend some time doing some shooting and lay-up drills to loosen up. We then meet as a team and talk about the opposition before we warm up together . . . It’s during this time when I would start to picture myself achieving the goals I’ve set for the game ahead.

It was expressed by the participants that their preperformance routines did not lower or eliminate the symptoms associated with competitive anxiety. For instance, “Even during my routine, I would still get nervous. You can’t avoid it.” Alternatively, it was reported by the participants that this advanced psychological strategy enabled them to control their anxiety-related symptoms, “It [a preperformance routine] stops you being distracted by irrelevant things, which helps you feel more settled and more in control beforehand.” One perceived line of reasoning emerged to explain how this strategy enabled the participants to



**Figure 3** — Causal network 3: The effects of preperformance routines upon the intensity and interpretation of symptoms associated with competitive anxiety. Arrows illustrate the relationship direction of the linked variables. Percentages represent the number of participants reporting experiencing the variable. Due to the direction of the relationship, maps are best interpreted from left to right. ↓ = Decreased and ↑ = Increased. SC = Self-Confidence and P = Performance.

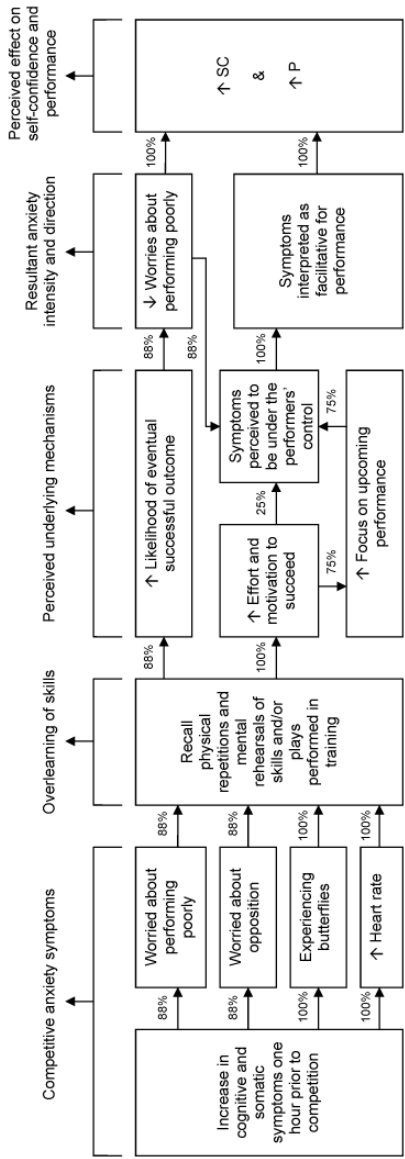
establish control of their anxiety-response. Experienced cognitive (e.g., “worried about letting team-mates down,” 75%) and somatic (e.g., “body feeling tight,” 8%) symptoms were initially met with certain dissociation strategies (i.e., physical warm-up and, if applicable, preparing equipment). One athlete commented, “I experience some nerves but not many during the warm-up as I’m not thinking about the match yet . . . I wouldn’t want to waste any nervous energy.” However, these thoughts and feelings were reported by all the participants to heighten closer to the onset of competition, which is when they would make a committed decision to use a combination of basic psychological skills (i.e., goal-setting, imagery, and self-talk) to control their anxiety-related symptoms. The combined use of these mental strategies would then allow the majority of participants (75%) to focus entirely on their upcoming competition. One athlete provided the following account:

Before racing we usually follow the same routine to a degree. However, it is not always possible to carry out the same warm-up each time as there may be traffic on the river; although we do plan to complete the full warm-up. Then, once we have sorted the boat and had a few practice stokes, its time to deal with the nerves by spending some time just picturing the perfect start and saying positive things to myself to get me focused for the race.

Once perceived control over the anxiety-response was attained, all the participants reported having facilitative directional interpretations and heightened levels of self-confidence, which helped them to have an optimistic outlook for their imminent performance. For instance, “After going through my routine, I’ll be physically ready and in a more positive and confident mood for the game.” Another athlete commented, “What I aim to do during my routine is take control of what I can in the lead up to a race . . . and as I am in control, it is a much more positive experience, which definitely gets the best out of me.”

### **Causal Network 4: Overlearning of Skills**

Figure 4 shows the influence of overlearning of skills upon the level and interpretation of precompetitive anxiety-related symptoms. None of the participants reported that they had overlearned all the skills required by their sport. However, they did report repeatedly practicing the relevant core skills (e.g., kicking, passing, and/or shooting) in a structured way during training. Specifically, the participants reported that they would set goals and record the number of physical repetitions of fundamental skills and/or plays they would successfully perform in training, as well as when they would use mental rehearsal (e.g., at certain intervals and/or when they became physically fatigued). One athlete commented, “I plan to go through each move 20 times in training; just endless repetitions, repeated over and over. And if they work 19 out of 20 times they’re going in the routine and if not they’re coming out.” Another participant stated, “We go over any new plays an endless number of times, but we can’t keep doing that for too long. That’s why combining it with imagery is so useful. . . . It [imagery] doesn’t take any physical effort.” Although this advanced strategy was used within the training environment, it was reported by the participant that they would recall their physical repetitions and mental rehearsals at various times and locations within the hour before competition.



**Figure 4** — Causal network 4: The effects of overlearning of skills upon the intensity and interpretation of symptoms associated with competitive anxiety. Arrows illustrate the relationship direction of the linked variables. Percentages represent the number of participants reporting experiencing the variable. Due to the direction of the relationship, maps are best interpreted from left to right. ↓ = Decreased and ↑ = Increased. SC = Self-Confidence and P = Performance.

With regard to the intensity of symptoms experienced, it was perceived by the majority of participants that overlearning of skills would influence the level of symptoms encountered before competition. The causal reason reported by the participants for this perceived relationship was that certain negative expectations (i.e., “worried about performing poorly,” 88%) would lead them to recall successful physical repetitions and mental rehearsals produced in training. Consequently, these participants suggested this would provide them with the perception that they would successfully execute their specific skills and/or plays, which would lower their performance-related cognitive symptoms and bring them under their perceived control. For instance, “When I doubt myself, it’s reassuring to know I’ve done endless weeks of repetitions, which reduces the amount of doubts I have because I know I can do it.” However, all the participants expressed that this advanced psychological strategy would not lower or eliminate all their worrisome thoughts before competition. One athlete provided the following account:

It [overlearning of skills] doesn’t remove all the nerves. There are so many other things to consider. . . . You have to deal with the crowd, other competitors, the realization that all the training was for this, and the fact that everyone else around you is also nervous.

However, the remaining cognitive symptoms (e.g., “worried about the opposition,” 88%), together with the perceived physiological symptoms experienced (e.g., “experiencing butterflies,” 100%), were also reported by all the participants to be under their control due to the influence of this advanced psychological strategy. The perceived explanation expressed by all the participants to explain this relationship was that the cognitive and somatic symptoms they experienced prompted them to recall their physical repetitions and mental rehearsals executed in training, which heighten their level of “effort and motivation to succeed” (100%) before competition. One athlete expressed, “It [overlearning of skills] boosts your motivation as you don’t want those weeks upon weeks of rehearsal to go to waste.” The majority of participants (75%) then reported a perceived increase in their ability to focus upon the upcoming competition, “When your motivation is high, it stops your nervousness taking control as you’re focused on what you’re there to do.”

These categories of reasoning were ultimately then expressed by all the participants to lead them to interpret their anxiety-response as facilitative in relation to performance. One participant stated, “Once I’m motivated and focused, the anxiety I experience keeps me on edge and ready for the game ahead.” Heightened feelings of self-confidence and a positive outlook toward the forthcoming competition were thereafter reported by all the participants, “I have to know my training has gone well, and as I’ve done all these repetitions I feel more positive and confident about everything. I am just able to enjoy the whole experience.”

## Discussion

This study examined the influence of four advanced psychological strategies on the intensity and direction dimensions of precompetitive anxiety symptoms, and, where applicable, *how* these phenomena occur. Findings revealed that simulation

training, cognitive restructuring, preperformance routines, and overlearning of skills all affected the experience of anxiety-related symptoms before competition. Specifically, each strategy was expressed by the participants to enable them to interpret their anxiety-response as facilitative to performance (see Figures 1–4). However, only two advanced psychological strategies were revealed to influence the intensity of cognitive symptoms experienced (see Figure 2 & 4). These two strategies were overlearning of skills, which lowered performance-related cognitive symptoms; and cognitive restructuring, which transformed irrational concerns into more adaptive thought patterns. This latter transformational process involved the participants broadening their perspectives and then introducing positive statements and images of previous sporting accomplishments. Interestingly, the participants reported broadening their perspective by drawing upon nonsporting major life events before competition. Indeed, although researchers in the discipline of sport psychology have started to illustrate the positive and negative outcomes of nonsporting major life events (e.g., Connaughton et al., 2008; Williams & Andersen, 1998), future research needs to further capture the cross-over effects between various sporting and nonsporting domains.

None of the advanced psychological strategies were reported by the participants to influence the intensity of the somatic symptoms experienced before competition. It has been argued, however, that the perceived physiological symptoms athletes experience before competition may reflect the specific activation and arousal requirements of the task demands of the sport (Martens et al., 1990). Eliminating or lowering these somatic symptoms, therefore, may negatively influence athletes' mental and physical readiness for competition. Another potential reason why these advanced psychological strategies may have not influenced the intensity of somatic symptoms could be due to the elite nature of the sample examined. Previous studies have consistently shown elite performers to interpret the intensity of their anxiety-related symptoms as more facilitative than their nonelite counterparts (e.g., Jones & Swain, 1995; Perry & Williams, 1998). From a theoretical standpoint as well, processing efficiency theory (Eysenck & Calvo, 1992), multidimensional anxiety theory (Martens et al., 1990), and catastrophe models (Hardy, 1996) propose that, under certain circumstances, maintaining rather than lowering or eradicating anxiety-related symptoms may enhance performance. To substantiate these claims future research should replicate and extend these findings with nonelite performers and with sports that require a lower level of activation and arousal for optimal performance.

The perceived causal reasons through which these advanced psychological strategies influenced the experience of competitive anxiety were reported by the participants to be heightened attentional focus, feelings of familiarity, increased effort and motivation, an ability to rationalize with competitive anxiety, and perceived control over anxiety-related symptoms (see Figures 1–4). It is evident that these perceived mechanisms appear to tentatively confirm the assumptions held within theories and models that illustrate the potential positive consequences of anxiety toward performance. For example, support was provided for Eysenck and Calvo's (1992) processing efficiency theory that suggests cognitive anxiety may signal to the performer the importance of the forthcoming competition (see Figure 2), which may then lead to increased motivation to maintain or even enhance performance (see Figure 2 & 4). Jones's (1995) control model of facilitative and debilitating competitive anxiety was also supported, which

hypothesizes that performers who appraise they possess a degree of control over themselves and the environment will report facilitative directional interpretations (see Figures 1–4). Although more research is required to substantiate the mechanisms highlighted in this study, it is clear that qualitative methods of inquiry can prove useful in explaining how prevalent theories and models may relate to one another. Such integration is fundamental to the enhancement of our understanding of the anxiety-performance relationship and is of the utmost importance for future inquiry.

The use of each advanced psychological strategy was also reported by the participants to increase levels of self-confidence and performance (see Figures 1–4). These findings are particularly noteworthy considering that researchers have identified self-confidence as an important attribute of the mentally tough performer (Jones et al., 2007). Considering, therefore, that mental toughness has been reported to be the most important psychological characteristic in achieving performance excellence (e.g., Gould et al., 2002), future research should explore how advanced psychological strategies could form part of a training program to help develop, enhance, and/or maintain mental toughness. Clearly sport psychologists will not only have an important role in educating athletes and coaches about the use of these advanced strategies, but also how the underlying mechanisms operate to maximize their psychological benefits. Recognizing the issues of generalization with this study, however, future research should also examine the use of advanced psychological strategies more closely, and compare and contrast their effectiveness with athletes debilitated by competitive anxiety. Such endeavors, taken together with the present findings and other relevant evidence-based research (Wadey & Hanton, 2008), will not only enhance our understanding of the relationship between advanced psychological strategies and competitive anxiety, but also place the discipline of sport psychology in a stronger position to promote the potential benefits of such strategies to National Governing Bodies, coaches, and sports performers.

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