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The relationship between psychological skills usage and competitive anxiety responses

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Abstract

Objectives. To investigate equivocal findings within the literature addressing the relationship between competitive anxiety responses and psychological skills. Intensity (i.e. level) and direction (i.e. interpretation of intensity as facilitative or debilitating) dimensions of competitive state anxiety and self-confidence were examined in performers with different levels of psychological skills usage.

Design. Cross-sectional design assessing psychological constructs during competition. The independent variable was psychological skill usage (“high” and “low” groups) and dependent variables were competitive anxiety responses.

Method. Non-elite competitive swimmers ($N=114$) completed a modified version of the Competitive State Anxiety Inventory-2 (CSAI-2) which examined both intensity and direction dimensions prior to racing. Following the event these participants completed the Test of Performance Strategies (TOPS) which measures psychological skills usage. Based on the TOPS scores the swimmers were dichotomised using post-hoc median-split into high and low usage groups for certain psychological skills.

Results. MANOVAs revealed significant differences in the CSAI-2 scores between the high and low usage groups for the skills of relaxation, self-talk and imagery. ANOVAs indicated significant differences on all CSAI-2 subscales for relaxation groups, and differences on cognitive intensity, somatic direction and self-confidence for self-talk groups, and self-confidence for the imagery groups.

Conclusions. Non-elite swimmers, in contrast with previous research examining elite swimmers (Hanton, S. & Jones, G. (1999a). The acquisition and development of cognitive skills and strategies: I. Making the butterflies fly in formation. *The Sport Psychologist*, 13, 1–21), primarily use relaxation strategies to reduce and interpret their anxiety intensity levels as facilitative, relying minimally on other psychological skills. © 2000 Elsevier Science Ltd. All rights reserved.

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Recent research within multidimensional competitive anxiety has disputed the supposition that anxiety is always negative and detrimental to performance. In two pivotal review papers, Jones (1991, 1995) introduced the notion of “direction” as a result of dissatisfaction with the “intensity alone” approach adopted in typical uses of the Competitive State Anxiety Inventory-2 (CSAI-2; Martens, Burton, Vealey, Bump & Smith, 1990). Specifically, the CSAI-2 measures only the level (i.e. intensity) of pre-competitive cognitive anxiety and perceived physiological symptoms and fails to take into account the individual’s interpretation of these symptoms as to whether they have a positive or negative effect on performance (i.e. direction). These observations led to the development of a modified version of the CSAI-2, which measures both the intensity of these symptoms on the original scale, and the direction on a bipolar scale ranging from debilitating to facilitative (Jones & Swain, 1992). These conceptual developments provided the incentive for a research programme by Jones, Swain, Hanton and colleagues who have successfully identified several individual difference variables including: competitiveness (Jones & Swain, 1992), performance (Jones, Swain & Hardy, 1993), skill level (Jones, Hanton & Swain, 1994; Jones & Swain, 1995), and goal attainment expectancy (Jones & Hanton, 1996). Direction of anxiety has also been investigated regarding the influence of affect (Jones, Swain & Harwood, 1996), the antecedents and temporal patterning of the anxiety response (Hanton & Jones, 1997; Wiggins, 1998), locus of control beliefs (Ntoumanis & Jones, 1998), trait anxiety as a function of gender and skill (Perry & Williams, 1998), and the nature of the sport (Hanton, Jones & Mullen, 2000).

The findings of Jones et al. (1993, 1994) and Jones and Swain (1995) are particularly relevant in the context of the present investigation. In these studies, good, elite and superior skilled performers interpreted the intensity of their symptoms as more facilitative than the poor, non-elite and inferior skilled performers in competition, despite no differences in levels of anxiety intensity. They also reported higher levels of self-confidence. These findings provided a rationale to investigate the mechanisms via which facilitative interpretations have been learned and developed by better performers and, importantly within the context of this study, the influence of different psychological skills on the competitive anxiety response.

Four lines of enquiry have examined the psychological skills that are important in moderating the intensity and direction of pre-competitive anxiety symptoms. First, Maynard and colleagues (1995) conducted two intervention studies examining the effects of various anxiety reduction techniques on soccer players debilitated by anxiety symptoms (Maynard, Hemmings & Warwick-Evans, 1995; Maynard, Smith & Warwick-Evans, 1995). The results indicated that a reduction in anxiety intensity levels via relaxation techniques was associated with more facilitative interpretations of pre-competitive symptoms and higher self-confidence. Second, Jones and Hanton (1996) demonstrated that competitive swimmers with positive expectations of goal achievement reported their anxiety symptoms, both cognitive and somatic, as being more facilitative than those who had negative goal expectations. Third, soccer players have experienced lower anxiety levels, more facilitative interpretations and greater self-confidence in response to “challenge” imagery situations as opposed to “pressure” situations (Hale & Whitehouse, 1998). Fourth, recent research by Hanton and Jones (1999a), using a different methodological approach, employed interviews to examine the acquisition of cognitive skills and strategies that enable elite swimmers to interpret pre-race symptoms as facilitative. Inductive procedures revealed that as the swimmers progressed in standard they developed, and followed, refined pre-competition and pre-race routines. Specifi-

cally, these routines involved the use of mental imagery, goal-setting strategies and the rationalisation of thoughts and feelings to maintain facilitative interpretations of symptoms. In a follow-up study, Hanton and Jones (1999b) examined the effects of a multi-component intervention on swimmers debilitated by their cognitive and somatic symptoms. The intervention design was based on the emergent data from the interviews and included the psychological skills of goal-setting, imagery and self-talk. Post-intervention, all of the participants reported facilitative interpretations, increases in self-confidence and performance improvements. Interestingly, in contrast to the findings of Maynard and associates (1995) and Hale and Whitehouse (1998), there were no differences in anxiety intensity levels throughout Jones and Hanton's (1996) and Hanton and Jones' (1999b) research.

Within the aforementioned studies, the psychological skills of relaxation, goal-setting, imagery and self-talk emerged as particularly pertinent in influencing the competitive anxiety response. Space precludes a review of the considerable psychological skills literature (for detailed reviews in sport psychology, see Greenspan & Feltz, 1989; Hardy, Jones & Gould, 1996; Vealey 1988, 1994). Nevertheless, it is important to highlight two key issues from the literatures on psychological skills and competitive anxiety. First, research findings differ as to whether psychological skills usage influences intensity and/or direction of anxiety symptoms. Second, no research has identified the relative contributions of different psychological skills to the anxiety response.

The purpose of the present study was to investigate these issues via the examination of differences in intensity and direction of competitive state anxiety and self-confidence in performers with varying levels of psychological skills usage. Specifically, differences between "high" and "low" usage groups in the psychological skills of relaxation, goal-setting, imagery and self-talk were examined. Multidimensional anxiety theory provided a framework, to complement and extend previous research that has mainly utilised either intervention or qualitative designs to investigate important psychological skills that influence the competitive anxiety response. Based on previous studies it was hypothesised that performers who demonstrated higher psychological skills usage would interpret pre-competitive anxiety symptoms as facilitative and display higher self-confidence than those with lower psychological skills usage.

Method

Participants

The participants were 114 competitive swimmers¹ ($n=65$ males, $n=49$ females) from a wide range of swimming events whose ages ranged from 17 to 26 years ($M=19.18$, $SD=2.01$). All participants were volunteers who provided informed written consent and had at least 5 years experience of competitive swimming ($M=10.62$, $SD=3.09$). A high standard sample (ranging from regional to national level) was drawn from three different competitions during the 1998–1999 season.

¹ For comparison purposes competitive swimming was selected to continue the detailed examination at an individual sport level previously adopted by Hanton and Jones (1999a, 1999b), Jones and Hanton (1996) and Jones et al. (1994).

Instrumentation

Modified CSAI-2

The modified version of the CSAI-2 was used to measure intensity and direction of pre-performance cognitive anxiety, somatic anxiety and self-confidence with nine items in each subscale. Participants rated the intensity of each item on a scale anchored by 1 (“not at all”) and 4 (“very much so”), with overall subscale intensity scores ranging from 9 to 36. Satisfactory internal consistency for the intensity of the subscales has been reported previously with Cronbach alpha coefficients ranging from 0.79 to 0.90 (Martens et al., 1990).

Jones and Swain’s (1992) direction scale was included for each item in which each respondent rated the degree to which the experienced intensity of each symptom was either facilitative or debilitating to subsequent performance using a bipolar scale ranging from –3 (“very debilitating”) to +3 (“very facilitative”). Overall subscale direction scores ranged from –27 to +27, where a negative score denoted a state of debilitation and a positive score facilitation. Four studies have reported internal reliability coefficients for the direction subscales, ranging from 0.72 to 0.90 (Hanton et al., 2000; Jones & Hanton, 1996; Swain & Jones, 1996; Wiggins, 1998).

Test of performance strategies (TOPS)

The TOPS (Thomas, Murphy & Hardy, 1999) was developed to measure psychological skills used by athletes in various sport situations. Specifically, TOPS examines athletes’ use of activation, relaxation, imagery, goal-setting, self-talk, automaticity, emotional control, and negative thinking/attentional control during competition and practice settings. There are four items in each subscale. Based on previous research findings a clear rationale was present for examining the relaxation, goal-setting, imagery and self-talk skills during competition (cf. Hale & Whitehouse, 1998; Hanton & Jones, 1999b; Jones & Hanton, 1996; Maynard et al., 1995). Consequently, the other subscales were not included in the present study. Examples of items during competition included for relaxation “I am able to relax if I get too nervous at competition” and for goal-setting “I set personal performance goals for a competition”. Items for imagery included “I imagine my competitive routines before I do it at competition” and for self-talk included “I talk positively to myself to get the most out of competition”. Participants rated the frequency of each item on a scale anchored by 1 (“never”) to 5 (“always”), with overall psychological skill usage scores ranging from 4 to 20. Thomas et al. (1999) reported Cronbach alpha coefficients of 0.80 for relaxation, 0.78 for goal-setting, 0.79 for imagery and 0.80 for self-talk.

Procedures

The modified CSAI-2 was administered approximately 1 h prior to the swimmers’ competitive events (*M* completion time prior=42 min). This time frame was employed by Jones and Hanton (1996) and Jones et al. (1994) with swimmers and was regarded as acceptable because it was verbally verified with the participants that it did not interfere with their preparation routines. The TOPS was administered approximately 1 h after the swimmers events (*M* completion time after=38 min), and away from the competition arena to ensure that participants responded accurately and without any external interference. Prior to completion of the questionnaires, each swimmer was presented with standardised instructions based upon the recommendations of Martens et al. (1990)

and Thomas et al. (1999) respectively. The instructions asked participants to respond to the modified CSAI-2 according to how they felt “right now” about performance and to the TOPS according to how frequently certain situations applied to them in general.² To minimise social desirability, the instructions emphasised the anonymity and confidentiality of responses at an individual level, the need for honesty and that there were no correct or incorrect answers.

Data analysis

The analysis of the data was divided into a number of stages. The first stage involved calculation of correlation coefficients among the CSAI-2 subscale intensity and direction scores. Separate multivariate analyses of variance (MANOVAs) were conducted to determine group differences and correlation coefficients were calculated to assess covariate influences. The next stage involved dichotomising participants, via post-hoc median-split, into “high” and “low” usage groups based on their scores for each psychological skill. In order to achieve truly distinct usage groups, participants who scored the same as the median were omitted from the analysis for that particular psychological skill. Separate MANOVAs, within each of the four psychological skills, were then conducted with modified CSAI-2 subscale intensity and direction scores as the dependent variables and the psychological skill groups (i.e. high versus low) as the independent variables. Eta-squared calculations were carried out for each MANOVA to establish the percentage of variance that group differences accounted for in the dependent variables. Finally, follow-up univariate factorial analyses of variance (ANOVAs) were conducted in the cases of all significant MANOVA effects.

Results

Correlation analyses

Correlation coefficients were calculated among the CSAI-2 subscale intensity and direction scores. The relationship between cognitive anxiety intensity and somatic anxiety intensity ($r=0.64$, denoting 41% common variance) was higher than previous studies (e.g. Gould, Petlichkoff & Weinberg, 1984; Jones & Hanton, 1996; Martens et al., 1990). Between the intensity and direction dimensions the highest correlation was -0.42 , denoting 18% common variance at most. These values are acceptable and support the separate measurement of cognitive anxiety and somatic anxiety, and intensity and direction.

The high, positive relationship ($r=0.85$, denoting 72% common variance) between self-confidence intensity and self-confidence direction is a magnitude similar to that reported by Jones et al. (1993) ($r=0.80$, denoting 64% common variance). Jones et al. (1993) subsequently argued that due to the high percentage of shared variance, the intensity and direction dimensions of this construct essentially measure the same affective state and are conceptually equivalent.

² The TOPS is a generic measure, thus psychological skill usage was not specific to the race the swimmers had just competed in.

Group differences

MANOVA indicated that there were no differences between males and females on the modified CSAI-2 scores ($p>0.05$). MANOVA also revealed no differences among the three swim meets sampled on any of the dependent variables. Thus, data from gender and competition were combined for analyses.

Assessment of covariate influences

No significant relationship existed between age, experience and competitive standard ($p>0.05$). Consequently, these demographic variables were not used in any subsequent analyses.

CSAI-2 responses as a function of psychological skills usage

Separate MANOVAs were conducted to establish if any overall significant differences were evident in the modified CSAI-2 scores between the “high” and “low” usage groups for each of the psychological skills; relaxation, self-talk, imagery and goal-setting. Psychological skill groups (i.e. high versus low) acted as the independent variables, with cognitive anxiety intensity and direction, somatic anxiety intensity and direction, and self-confidence intensity³ acting as the five dependent variables in each analysis.

Relaxation

The median-split for relaxation usage ($Mdn=13$) resulted in 44 performers in the high group ($M=16.11$, $SD=1.86$) and 54 performers in the low group ($M=9.57$, $SD=2.12$). The MANOVA was significant (Wilks' lambda = 0.57, $F(5, 92)=13.61$, $p<0.001$) and calculation of eta-squared revealed that group differences accounted for 43% of the variance in the dependent variables. Means, standard deviations and F ratios for the follow-up analyses for relaxation usage are presented in Table 1. The groups significantly differed on levels of cognitive anxiety and somatic anxiety intensity and direction and self-confidence intensity. The mean scores for cognitive and somatic anxiety direction demonstrate facilitation for the high group and debilitation for the low group. The cognitive and somatic anxiety intensity scores were lower in the high group compared to the low group. Self-confidence intensity was higher in the high group in contrast to the mean of the low group.

Self-talk

Following the median-split ($Mdn=12$), the high self-talk usage group consisted of 50 swimmers ($M=14.42$, $SD=1.33$) and the low group of 52 swimmers ($M=8.42$, $SD=2.13$). The MANOVA was significant (Wilks' lambda = 0.80, $F(5, 96)=4.67$, $p<0.001$) and subsequent eta-squared calculations indicated that self-talk group differences accounted for 20% of the variance in the anxiety response. Descriptive data and F ratios for the univariate analyses for self-talk usage are presented in Table 1. Cognitive anxiety direction did not differ between the two groups, however cognitive

³ In accordance with Jones et al. (1993) and other direction studies (e.g. Hanton & Jones, 1997; Jones et al., 1994; Jones & Swain, 1995) self-confidence direction was not incorporated as a dependent variable in subsequent analyses.

Table 1
Means, standard deviations and F ratios for one-way analyses of variance for relaxation, self-talk and imagery usage

	Low group <i>M</i> (<i>SD</i>)	High group <i>M</i> (<i>SD</i>)	<i>df</i>	<i>F</i>	<i>p</i>
Relaxation					
<i>n</i>	54	44			
Cognitive anxiety					
Intensity	22.44 (4.94)	17.32 (4.44)	1,96	28.57	<0.001
Direction	−5.91 (8.91)	3.79 (8.76)	1,96	29.18	<0.001
Somatic anxiety					
Intensity	20.48 (4.72)	14.84 (3.41)	1,96	44.10	<0.001
Direction	−0.19 (7.69)	7.61 (7.42)	1,96	25.74	<0.001
Self-confidence					
Intensity	17.33 (5.38)	25.05 (4.88)	1,96	54.08	<0.001
Self-talk					
<i>n</i>	52	50			
Cognitive anxiety					
Intensity	21.21 (5.37)	18.16 (5.37)	1,100	8.22	<0.05
Direction	−2.87 (9.54)	1.12 (10.83)	1,100	3.90	NS
Somatic anxiety					
Intensity	18.69 (4.91)	16.80 (5.09)	1,100	3.66	NS
Direction	1.31 (7.77)	5.30 (8.99)	1,100	5.77	<.05
Self-confidence					
Intensity	18.50 (6.08)	23.72 (5.94)	1,100	19.22	<.001
Imagery					
<i>n</i>	52	49			
Cognitive anxiety					
Intensity	20.46 (5.44)	19.55 (5.62)	1,99	.68	NS
Direction	−2.83 (10.16)	.53 (10.45)	1,99	2.68	NS
Somatic anxiety					
Intensity	17.48 (4.93)	18.02 (5.03)	1,99	.30	NS
Direction	2.23 (8.44)	4.31 (8.70)	1,99	1.48	NS
Self-confidence					
Intensity	19.33 (6.44)	22.39 (6.12)	1,99	5.98	<.05

anxiety intensity was lower in the high group compared to the low group. Conversely, somatic anxiety intensity did not differ between the groups and the somatic anxiety direction was interpreted as being more facilitative in the high group than the low group. Also, self-confidence intensity was higher in the high group than the low group.

Imagery

The median-split for imagery usage ($Mdn=13$) resulted in 49 performers in the high group ($M=15.94$, $SD=1.71$) and 52 performers in the low group ($M=9.79$, $SD=2.37$). The MANOVA was significant (Wilks' lambda = 0.87, $F(5, 95) = 2.87$, $p < 0.05$). Eta-squared calculations showed that imagery group differences accounted for 13% of the variance in the anxiety symptoms. *F* ratios for the post hoc analyses, together with descriptive data, for imagery usage are presented

in Table 1. Cognitive and somatic anxiety intensity and direction did not differ between the two groups, but self-confidence intensity scores were higher in the high group. The mean scores reveal that self-confidence intensity was higher in the high group than in the low group.

Goal-setting

Following the median-split ($Mdn=15$), the high goal-setting usage group consisted of 44 swimmers ($M=17.73$, $SD=1.48$) and the low group of 55 swimmers ($M=12.02$, $SD=1.86$). The MANOVA was not significant (Wilks' lambda = 0.92, $F(5, 93) = 1.55$, $p > 0.05$) and eta-squared calculations demonstrated that goal-setting group differences accounted for only 8% of the variance in the modified CSAI-2 scores. As a result of the multivariate analysis not reaching significance, follow-up one-way analyses were not conducted.

Discussion

The purpose of this study was to further investigate equivocal findings within the literature addressing the relationship between competitive anxiety responses and psychological skills. Specifically, differences in intensity and direction of competitive state anxiety and self-confidence between groups of performers who were “high” and “low” in the psychological skill usage of relaxation, self-talk, imagery and goal-setting were examined. The findings revealed overall significant differences in the competitive anxiety response between the relaxation, self-talk and imagery groups. No differences were found for goal-setting usage.

The hypothesis that performers who demonstrated higher psychological skills usage would interpret pre-competitive anxiety symptoms as facilitative and display higher self-confidence was partially supported in the case of relaxation, self-talk and imagery. Interestingly, greatest support came in the area of relaxation. Swimmers demonstrating high usage of relaxation strategies during competition had lower intensity levels and more facilitative interpretations of cognitive and somatic anxiety than those demonstrating low relaxation usage. They were also more self-confident. Maynard and colleagues (1995) reported comparable findings after employing relaxation techniques with soccer players. Their results indicated that a reduction in anxiety levels was associated with more facilitative interpretations and increases in self-confidence. Given the standard of the performers across the studies, the concurrence in these findings is not surprising. The soccer players in Maynard et al.'s study were semi-professional (i.e. non-elite) and the competitive swimmers ($N=114$) sampled in the present study were drawn from a similar standard to that of the non-elite group of swimmers ($n=114$) in Jones et al.'s (1994) investigation.⁴ The similarities are reflected in very comparable CSAI-2 subscale intensity and direction scores. For example, Jones et al. (1994) found mean cognitive anxiety intensity and direction scores of 20.25 and 47 in their non-elite sample, compared to 19.82 and -0.71 for the sample in this study. Therefore, it appears that non-elite performers can, and do use, relaxation techniques to lower anxiety intensity to comfortable and manageable levels to enable them to interpret symptoms as more beneficial

⁴ The identical sample sizes between the present study and Jones et al.'s (1994) investigation were a coincidence.

to performance and become more self-confident. Whether lowering the anxiety intensity levels is actually more beneficial to performance is debatable (cf. Hanton & Jones, 1999a; 1999b; Jones et al., 1993; 1994; Jones & Swain, 1995). Hardy et al. (1996), with reference to the results of relaxation interventions, observed that, “whilst the findings have generally shown reductions in state anxiety, the findings relating to performance have not always shown improvements” (p. 15). Although performance data were not collected for this study, Hardy et al.’s (1996) statement is particularly important when considering the practical implications and will therefore be revisited later.

Self-talk and imagery usage demonstrated less support for the study hypothesis. Thus, the non-elite swimmers sampled in the present investigation generally appear not to rely on self-talk and imagery to help them interpret anxiety symptoms as facilitative, unlike the elite swimmers examined by Hanton and Jones (1999a). Concerning the self-confidence aspect of the hypothesis, the high self-talk and imagery groups were both more self-confident than their respective low usage groups. Verbal persuasion and self-talk have been advised for some time as a means of manipulating self-efficacy and confidence (e.g. Bandura, 1977; Mahoney, 1979), however research findings have proved inconclusive (see Feltz, 1988). Nevertheless, cognitive-behavioural interventions that use self-talk techniques for building confidence have been recently recommended in the literature addressing applied sport psychology (e.g. Zinsser, Bunker & Williams, 1998) and have been successfully employed by Hanton and Jones (1999b). In addition, the confidence enhancing effects of imagery have also been highlighted (e.g. Callow, Hardy & Hall, 1998; Feltz & Riessinger, 1990; Hale & Whitehouse, 1998; Hanton & Jones, 1999b; Moritz, Hall, Martin & Vadocz, 1996; Orlick, 1990; Rushall, 1988; Suinn, 1996; Vadocz, Hall & Moritz, 1997; Vealey, 1986).

Goal-setting did not emerge as an influencing factor. This was somewhat surprising given Jones and Hardy’s (1990) assertion that a potentially interesting relationship exists between goal-setting and competitive anxiety and that previous research has found that goal-setting was an important factor in moderating the interpretation of pre-competitive anxiety symptoms (Hanton & Jones, 1999a,b; Jones & Hanton, 1996). Several possible reasons may account for this lack of accord. First, the findings of this study need to be treated with a degree of caution in that the dependent variables (competitive anxiety responses) have been used in multiple independent variable analyses (four different psychological skills). Applied sport psychologists and performers often use hybrid techniques, such as relaxation and imagery, and the effect might result from the combination of the two. Second, it would be erroneous to infer psychological skill ability from usage. Importantly, although the swimmers in the present study may have used the skills regularly they may not have been as proficient at them as they could be. The importance of this subtlety cannot be overstated and therefore provides an interesting avenue for future research. Further, Burton (1989) exemplified this point when he found that competitive swimmers, despite using goal-setting strategies, often failed to lower unrealistic goals and warned that goals can be stress producing when set too high. Burton (1992) concluded:

Therefore, the notion that goals are a simple performance enhancement strategy may be somewhat simplistic in sport because unrealistic goals can impair rather than facilitate performance (p. 268).

Calculation of eta-squared revealed that competitive anxiety scores are influenced primarily by

relaxation, followed by self-talk, imagery and finally goal-setting usage. The finding that relaxation usage is not the sole influence on anxiety scores is not surprising. Clinical psychologists (e.g. Goleman, 1995) have advised that worriers should not rely exclusively on relaxation strategies, but must use various techniques to actively challenge worrisome thoughts and feelings. Indeed, Hanton and Jones (1999a) revealed that elite swimmers “actively challenge” their anxiety by rationalising their pre-race symptoms via self-talk strategies. Further, the fact that self-talk has a greater influence on the competitive anxiety response than imagery may be partly explained by the observation that worries often follow a narrative to oneself that proceeds from one concern to another. These cognitions are generally verbalised using words and not pictorially imagined, a fact that is particularly pertinent regarding the control of anxiety (Goleman, 1995).

From a practical perspective, performers should learn a wide range of psychological skills that can be used within a comprehensive psychological programme, supporting the practical recommendations made by Hanton and Jones (1999b). In particular, the skills of self-talk and imagery are encouraged to enhance performers’ self-confidence. Specifically, positive self-talk and motivational general-mastery imagery are recommended because these techniques are most effective when their content is associated with success and competence (see Martin, Moritz & Hall, 1999; Zinsser et al., 1998).

Regarding the psychological skills recommended to interpret anxiety symptoms as facilitative, the authors are hesitant to emphasise the principal psychological skill identified in this investigation (i.e. relaxation). This is because the present study (and Maynard and co-workers’ studies) used a non-elite sample, as opposed to the elite sample used by Hanton and Jones (1999a). Research has consistently shown that better performers interpret the intensity of their anxiety symptoms as more facilitative than worse performers in competition (Jones et al., 1993, 1994; Jones & Swain, 1995). Thus, although this study demonstrates that relaxation usage was the most influential psychological skill for interpreting anxiety as facilitative, one must remember that as a sample, non-elite athletes still interpret their symptoms as less facilitative to performance compared to elite athletes (Jones et al., 1994). Therefore, after synthesising the findings of the present study and Maynard and colleagues’ (1995) studies, it can be speculated that non-elite athletes probably adopt a relaxation strategy whereby they reduce their anxiety symptoms to interpret them as more facilitative to performance (cf. Jones & Swain, 1995). However, as alluded to previously, research has shown that reducing anxiety does not necessarily lead to performance improvements.

In order to attain a higher level of performance, swimmers must develop other psychological skills and strategies, including goal-setting, imagery and self-talk, to interpret their anxiety as facilitative to performance (cf. Hale & Whitehouse, 1998; Hanton & Jones, 1999a,b; Jones & Hanton, 1996). Non-elite performers may be advised to use relaxation strategies to reduce anxiety intensity to comfortable and manageable proportions, and then cognitively restructure their thoughts and feelings to elicit facilitative interpretations for subsequent performance (see Hale & Whitehouse, 1998; Maynard et al., 1995). To help produce these responses, various multimodal stress management packages are available that combine relaxation techniques and other psychological skills (e.g. Meichenbaum, 1975; Smith, 1980; Suinn, 1972a,b). However, arguably more importantly regarding improving performance, athletes should then reactivate their physiological and psychological arousal levels, while maintaining positive interpretations via goal-setting, imagery and self-talk strategies (see Hanton & Jones, 1999b; Jones & Hanton, 1996).

Partial support for this is evident outside of the research domain of anxiety direction. Previous studies have found that international athletes generally use a wider range of psychological skills and strategies than performers of a lower standard (e.g. Mahoney, Gabriel & Perkins, 1987; Thomas et al., 1999; Thomas & Over, 1994). Also, imagery and self-talk training have been employed to reduce golfers' negative emotions and cognitions, resulting in performance improvements (Thomas & Fogarty, 1997). From a theoretical standpoint, both reversal theory (Kerr, 1985) and catastrophe theory (Hardy, 1990) propose that, under certain circumstances, activation and cognitive restructuring techniques may be more effective than relaxation strategies in combating the negative effects of anxiety and enhancing performance.

Future research should examine the effectiveness of different interventions, particularly the efficacy of one strategy versus another, in eliciting facilitative interpretations and importantly performance improvements. Another line of enquiry worthy of attention is the exploration of various interactive effects of psychological skills with cognitive and somatic anxiety (cf. Hardy, 1990; Hardy & Parfitt, 1991). Also, which psychological skill contributes most to the affective response in elite athletes under conditions of competitive stress? Finally, future studies should address the effect on performance when different strategies combine to form a psychological skills package. Interpretive and idiosyncratic research approaches may be particularly useful for investigating some of these issues and increasing our understanding of the relationship between psychological skills and competitive anxiety responses.

In conclusion, it appears non-elite swimmers primarily use relaxation strategies to reduce and interpret their anxiety intensity levels as facilitative, relying minimally on other psychological skills. In contrast, elite swimmers maintain their intensity levels and use goal-setting, imagery and self-talk strategies to interpret symptoms as facilitative (Hanton & Jones, 1999a). Consequently, for athletes to improve performance, interpret pre-competitive anxiety as more facilitative to performance and increase self-confidence, emphasis should be placed upon cognitive restructuring techniques that include the psychological skills of goal-setting, imagery and self-talk, rather than relaxation strategies.

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