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

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Summary—Previous research which has examined debilitative and facilitative dimensions of anxiety has tended to adopt a unidimensional anxiety framework and to investigate relationships with academic (cognitive) performance. The major purpose of this study was to employ a multidimensional anxiety framework and to examine 'intensity' (i.e. level) and 'direction' (i.e. interpretation of level as either debilitative or facilitative) of anxiety symptoms in the context of sports (motor) performance. The individual difference variable of skill level was investigated as a mediator of these responses. Elite (n = 97) and non-elite (n = 114) competitive swimmers completed a modified version of the Competitive State Anxiety Inventory-2 during the period preceding an important race. The findings showed that there was no difference between the two groups on the intensity of cognitive and somatic anxiety symptoms, but that elite performers interpreted both anxiety states as being more facilitative to performance than the non-elite performers. Furthermore, self-confidence was higher in the elite group. Further analyses investigated differences between those swimmers who reported their anxiety as debilitative and those who reported it as facilitative in the elite and non-elite groups. These showed that anxiety intensity levels were higher in the debilitated than the facilitated swimmers in the non-elite group, but no such differences were evident in the elite group. These findings provide further support for the distinction between intensity and direction of competitive state anxiety symptoms. They also emphasize the importance of skill level as an individual difference variable in the examination of the nature of the competitive anxiety response.

INTRODUCTION

Recent research in the area of competitive state anxiety has adopted a multidimensional approach, based upon earlier advancements in the clinical and test anxiety literatures, in which the anxiety response is separated into cognitive and somatic components (Davidson & Schwartz, 1976; Liebert & Morris, 1967). The move towards a multidimensional conceptualization of competitive state anxiety was largely stimulated by the work of Martens, Burton, Vealey, Bump and Smith (1982, 1990) who developed a questionnaire, the Competitive State Anxiety Inventory-2 (CSAI-2), which measures cognitive and somatic anxiety, plus self-confidence. Subsequent research using the CSAI-2 has provided evidence to support the separation of these components of the competitive anxiety response (e.g. Burton, 1988; Gould, Petlichkoff, Simons & Vevera, 1987; Jones, Swain & Cale, 1990, 1991).

Some investigators have argued, however, that this research suffers from limitations in terms of the actual measurement of anxiety (Jones, 1991, in press; Parfitt, Jones & Hardy, 1990). The CSAI-2, like many other state anxiety scales, essentially measures the 'intensity' of symptoms which are purported to signify the presence of anxiety. However, the inventory fails to measure what has been referred to by Jones and co-workers as the 'directional perceptions' of the symptoms; that is, the nature of the individual's interpretation of those symptoms in terms of whether they are positive or negative in relation to upcoming performance (Jones & Swain, 1992; Jones, Swain & Hardy, 1993). The intensity-alone approach to measuring competitive anxiety has prevailed in the sport psychology literature due to the fact that the concept of anxiety has largely been viewed as negative and detrimental to performance. However, some recent research findings suggest that this is not necessarily always the case and that anxiety can have positive effects (Jones & Cale, 1989; Jones et al., 1993; Parfitt & Hardy, 1993).

The notion of debilitating and facilitating dimensions of the anxiety response has been prominent in the test anxiety literature for a number of years. Alpert and Haber distinguished between debilitating and facilitating anxiety as long ago as 1960 and found that a scale which measured both dimensions (i.e. the Anxiety Achievement Test; AAT) provided a significantly stronger predictor of academic
performance than a conventional debilitating anxiety scale. Subsequent investigations employing the AAT have also demonstrated the value of distinguishing between debilitating and facilitating anxiety (e.g. Carrier, Higson, Klimoski & Peterson, 1984; Couch, Garber & Turner, 1983; Gaeddert & Dolphin, 1981). Wine's (1980) bidirectional model of test anxiety further supports the notion of positive and negative dimensions and argues for this greater specificity of the state anxiety response. Finally, research conducted by Carver and Scheier (1986, 1988) has led to the development of a control-process model, in which anxiety is hypothesized to enhance performance provided the performer maintains a favourable expectancy regarding goal attainment.

Whilst the work within the test anxiety context has provided the basis for important developments in anxiety research, its application to other areas, such as competitive anxiety, is somewhat limited on two counts. Firstly, it has examined the bidirectional model in the context of cognitive (i.e. academic) performance so that there is a need for investigation in the area of motor performance. Secondly, the research on debilitating and facilitating anxiety has largely examined an undifferentiated, unidimensional ‘test’ anxiety state as opposed to the more recently favoured multicomponent conceptualization of anxiety. Additionally, little research in the test anxiety literature has examined how individual difference variables may mediate individuals’ interpretations of their anxiety states.

The major purpose of this study, therefore, was to employ a multidimensional anxiety framework and to examine ‘intensity’ and ‘direction’ of anxiety symptoms in the context of sports (motor) performance. The individual difference variable of skill level was investigated as a mediator of these responses. Differences between highly skilled and less skilled sports performers have been reported in some previous research (e.g. Mahoney, Gabriel & Perkins, 1987), but this has largely been in the context of differences in the level or intensity of anxiety symptoms experienced. An early study by Mahoney and Avenner (1977) did report that highly skilled performers reported their anxiety as more facilitative than less skilled performers, but their study involved a small sample and a unidimensional operationalization of anxiety.

The study reported here examined elite and non-elite competitive swimmers during the period preceding a race. It was hypothesized that there would be no difference in the intensity of cognitive and somatic anxiety, but that elite performers would interpret their anxiety states as being more facilitative to performance than the non-elite performers. It was also hypothesized that self-confidence would be higher in the elite group.

A further purpose of this study was exploratory in nature since it sought to examine the intensity of the responses as a function of whether subjects reported their cognitive and physiological symptoms as debilitative or facilitative. Particular interest was focused upon the level of self-confidence in debilitated and facilitated individuals since it has been proposed that the direction of the anxiety response may mediate confidence levels (Bandura, 1977; Jones et al., 1993). This proposal was examined in this study as a function of skill level. Due to the exploratory nature of these analyses, no specific hypotheses were formulated.

**METHOD**

**Subjects**

The Ss comprised 211 competitive swimmers from a wide range of swimming events whose ages ranged from 13 to 29 yr (mean = 19.98; SD = 2.58). Elite (n = 97) and non-elite (n = 114) swimmers were distinguished on the basis of their achievement or non-achievement of the qualifying time set by the Amateur Swimming Association for participation in the 1992 Senior National Championships or 1992 Olympic Swimming Trials.

**Measures**

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

In addition, a ‘direction’ scale developed by Jones and Swain (1992) was included for the cognitive and somatic anxiety items in which each S rated the degree to which the experienced intensity of each symptom was either facilitative or debilitative to subsequent performance on a scale from −3 (“very debilitative”) to +3 (“very facilitative”). Thus, possible direction scores on each subscale ranged from −27 to +27.

**Procedure**

In order to obtain an adequate sample size, it was necessary to draw the sample from seven different swim meets during the 1992 season. The non-elite Ss were examined at the British Universities Sports Federation Open Championships, whilst the elite swimmers completed the questionnaire at the 1992 Olympic trials for the British team. The modified CSAI-2 was administered approx. 1 hr prior to their competitive events. This time frame was employed by Jones et al. (1990) and was regarded as an acceptable time to complete the questionnaire since it did not interfere with the swimmers’ warm up routines. Prior to completion of the CSAI-2, each swimmer was presented with standardized instructions based upon the recommendations of Martens et al. (1990). These emphasized the confidentiality of responses at an individual level, the need for honesty and an indication of their thoughts and feelings “right now”.

**RESULTS**

**Modified CSAI-2 scores as a function of skill level**

Separate one-way analyses of variance were carried out for each of the cognitive anxiety and somatic anxiety subscale intensity and direction scores, and also for self-confidence, to examine differences between the elite and non-elite groups. As may be seen in Table 1, the elite and non-elite swimmers did not differ significantly on either of the cognitive anxiety and somatic anxiety intensity scores. However, the elite swimmers reported significantly more facilitative interpretations of both cognitive anxiety ($P < 0.01$) and somatic anxiety ($P < 0.001$) symptoms in relation to their upcoming performance. A significant difference also emerged for self-confidence ($P < 0.001$), with the elite swimmers reporting a higher level.

**Intensity scores as a function of debilitation/facilitation and skill level**

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

### Table 1. Means, standard deviations and F ratios for one-way analyses of variance on modified CSAI-2 subscales

<table>
<thead>
<tr>
<th></th>
<th>Non-elite Mean (SD)</th>
<th>Elite Mean (SD)</th>
<th>d.f.</th>
<th>$F$</th>
<th>$P$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive anxiety</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intensity</td>
<td>20.25 (5.33)</td>
<td>20.21 (5.23)</td>
<td>1,209</td>
<td>0.003</td>
<td>NS</td>
</tr>
<tr>
<td>Direction</td>
<td>0.47 (8.44)</td>
<td>4.17 (8.47)</td>
<td>1,209</td>
<td>9.54</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Somatic anxiety</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intensity</td>
<td>18.79 (5.57)</td>
<td>18.91 (5.94)</td>
<td>1,209</td>
<td>0.87</td>
<td>NS</td>
</tr>
<tr>
<td>Direction</td>
<td>1.54 (7.81)</td>
<td>6.59 (7.22)</td>
<td>1,209</td>
<td>23.42</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Self-confidence</td>
<td>20.81 (3.68)</td>
<td>25.09 (3.27)</td>
<td>1,209</td>
<td>31.87</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>
Table 2. Contingency table of observed frequencies of debilitated and facilitated Ss as a function of skill level

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

\( \chi^2 \) Analysis. A 2 × 2\( \chi^2 \) analysis was carried out to investigate if the frequency of Ss in the debilitated and facilitated groups differed as a function of skill level. This revealed a significant difference (\( \chi^2 = 24.48; P < 0.001 \)), with the observed frequencies in the four cells shown in Table 2. The data reveals the small number of elite swimmers who reported debilitative states for both cognitive and somatic anxiety, and the relatively small number of non-elite swimmers who reported facilitative states. The majority of the elite swimmers reported facilitative states, whilst the majority of the non-elite swimmers reported debilitative states.

Analyses of variance. Two way analyses of variance (skill level × direction) were conducted on the cognitive anxiety intensity, somatic anxiety intensity and self-confidence scores. The findings for the cognitive anxiety intensity (\( P < 0.05 \)), somatic anxiety intensity (\( P < 0.05 \)) and self-confidence (\( P < 0.01 \)) scores revealed significant interactions in all three cases. Means, standard deviations and \( F \) ratios for the interactions are presented in Table 3. Follow-up Scheffe tests were employed to determine between which means significant differences were evident. The findings revealed that in the non-elite group, the debilitated Ss were higher on cognitive and somatic anxiety and lower on self-confidence than the facilitated Ss. In the elite group, on the other hand, there were no differences between debilitated and facilitated subjects on any of the variables.

**DISCUSSION**

The findings from this investigation provide further support for the distinction between intensity and direction of competitive state anxiety symptoms. They also emphasize the importance of skill level as an individual difference variable in the examination of the nature of the competitive anxiety response. The major hypothesis under investigation in this study was supported. Whilst the intensity of both the cognitive and somatic anxiety responses did not differ between the non-elite and elite groups, their interpretations of those responses in terms of their consequences for subsequent performance differed markedly. The elite group reported both responses as being more facilitative and less debilitative to their swimming performance. The more positive interpretation of the pre-competition symptoms on the part of the elite swimmers is likely to be tied in closely with the fact that they reported significantly higher levels of self-confidence. Interestingly, Jones et al. (1993) showed that the direction dimensions of cognitive and somatic anxiety correlated more strongly with self-confidence than did the intensity of both responses. These authors suggested that self-confidence
Intensity and interpretation of anxiety symptoms may in some way protect against potential debilitative anxiety effects. Indeed, it is those performers who have least confidence in their ability to control both themselves and the environment who are most likely to experience debilitative anxiety symptoms (Borkovec, Metzger & Prusinsky, 1986; Eysenck, 1992).

Further insight into differences between elite and non-elite performers is provided by the exploratory aspects of this study in which subjects were divided into groups based not only on skill level but also on whether they reported both their cognitive and somatic anxiety symptoms as being facilitative or debilitative. $\chi^2$ analysis revealed that, of the Ss who could be classified as either 'debilitated' or 'facilitated', 52.6% of the non-elite group experienced debilitative symptoms and 47.4% experienced them as facilitative. These proportions are in stark contrast to the 14.7% and 85.3% of the elite group who interpreted their symptoms as debilitative and facilitative, respectively. Whether such a difference is the cause or result of achieving elite status cannot be addressed in the context of the present study, but poses an interesting question for future research. A further question worthy of examination is how elite sports performers have acquired the cognitive skills and strategies which enable an effective coping response in high pressure situations.

Observation of the means of the intensity of cognitive anxiety, somatic anxiety and self-confidence in the debilitated and facilitated performers within the elite and non-elite groups provides a revealing pattern of results. The findings for the non-elite group show that the debilitated group experienced greater intensity of both cognitive and somatic anxiety symptoms, whilst self-confidence was considerably lower in the debilitated performers. In the non-elite group, on the other hand, there were no differences on any of the three subscales, although these findings should be treated with some caution since the debilitated group comprised only 11 swimmers. What is interesting about the non-elite group is that the intensity of the cognitive and somatic responses did appear to influence the swimmers' directional interpretations of them, with higher anxiety levels being associated with more negative interpretations of their potential consequences. However, in the elite group, debilitated and facilitated Ss did not differ on intensity. It is also interesting to note that self-confidence in the elite/debilitated group was the same as that in the elite/facilitated group. How elite performers maintain confidence levels in such situations is a question to be addressed in future studies.

Several other questions emanate from the findings of this investigation. A rather obvious one relates to the performance of the swimmers who experienced either facilitated or debilitated anxiety states. That this was not measured in the present study is a limitation, and performance variables should be examined in future studies in this area. Gould, Ecklund and Jackson's (1992) findings on a sample of elite U.S. wrestlers showed that their worst performances were associated with negative pre-competition feeling states, and their best performances with positive feeling states. Thus, future studies should examine whether the performance of individuals who report debilitated states is indeed impaired, and vice versa for the facilitated performers. Another question relates to whether one can predict who will report their anxiety symptoms as debilitative or facilitative, and in which situations. In addition to the distinction between elite and non-elite performers, other individual difference variables offer some interesting avenues. At the person level, it could be that performers' directional interpretations of their anxiety symptoms are strongly predicted by positive-negative affect (Watson & Clarke, 1984; Watson & Tellegen, 1985), with individuals high on negative affect consistently scoring high on positive affect and vice versa for the facilitated performers. Other, closely related, variables which are likely to be important sources of variance in directional interpretations are confidence and perception of control.

As alluded to earlier, it is hypothesized that it is those performers who have least confidence in their ability to control both themselves and the environment who will experience debilitative anxiety symptoms (Borkovec et al., 1986; Carver & Scheier, 1986, 1988; Eysenck 1992). An important situational variable is the nature of the sport, with the likelihood being that high intensity of the symptoms will be interpreted as facilitative for short duration, explosive sports but debilitative for longer duration, more finely-controlled skills. These questions refer only to main effects, but the interaction of such variables represents a further question to be addressed in a programme of research in this area.

In summary, these findings suggest that elite performers do not differ from non-elite performers on the intensity of pre-competition anxiety symptoms, but that they do have a more positive interpretation of these symptoms in terms of their consequences for performance. They also suggest
that elite performers who do experience debilitative anxiety symptoms possess an effective cognitive strategy for maintaining confidence levels. Finally, it is important to note, at a conceptual level, that a state in which cognitive and physiological symptoms, however intense, are interpreted as being facilitative to performance is unlikely to represent ‘anxiety’ at all. Instead, it will probably be labelled by the performer as ‘excitement’, ‘psyched up’, ‘motivated’, etc. This clearly has serious implications for the employment of conventional questionnaire measures of competitive state anxiety, and may help to explain a situation in which competitive anxiety researchers have largely been unsuccessful in explaining large proportions of performance variance. (see Swain & Jones, in press). For the most part, these questionnaires represent merely a measure of the intensity of certain cognitive and physiological symptoms which have been labelled as anxiety by those who have developed them. However, the performer’s own labelling of such symptoms appears to be considerably more pertinent.

REFERENCES


