

Gender Differences in Precompetition Temporal Patterning and Antecedents of Anxiety and Self-Confidence

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This study examined changes in, and antecedents of, cognitive anxiety, somatic anxiety, and self-confidence in a sample of male ($n=28$) and female ($n=28$) university athletes. Subjects responded to the Competitive State Anxiety Inventory-2 (Martens, Burton, Vealey, Bump, & Smith, 1990) and six antecedent items during the week preceding an important competition. In the case of cognitive anxiety, males showed no change across time; females showed a progressive increase as the competition neared. Males and females showed the same patterning in somatic anxiety with increases occurring only on the day of competition. Self-confidence scores revealed a reduction in self-confidence as the competition neared in both genders, but there was a greater decrease in females than in males. Stepwise multiple regression analyses showed that different antecedents predicted cognitive anxiety and self-confidence in males and females. Specifically, significant predictors in the females were associated with personal goals and standards; significant predictors in the males were associated with interpersonal comparison and winning.

Gender is acknowledged as an important interpersonal factor in competitive sport (Gill, 1988), with numerous authors (e.g., Ahlgren & Johnson, 1979; Olds & Shaver, 1980) having proposed that males are more competitive than females. Gill (1988) reported that males scored higher than females on competitiveness and win orientation and that females scored higher than males on goal orientation. Gill concluded that females seem to focus more on personal goals and standards that reflect a noncompetitive achievement orientation whereas males focus more on interpersonal comparison and winning.

Research findings have also demonstrated that females score higher than males on sport-specific trait anxiety (Gill, 1988; Martens, 1977). Andersen and Williams (1987) suggested that this is because traditional socialization of the sexes has favored males in terms of preparation for athletic competition in that they are exposed to and taught a competitive orientation to life more so than

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females. The suggestion has also been made that gender differences in expectancies of success or failure may be an important factor in determining competitive anxiety. Gill, Gross, Huddleston, and Shifflett (1984) proposed that competitive situations actually exaggerate gender differences in achievement cognitions, with females generally reporting less confidence and lower expectancies of success than males (Benton, 1973; House, 1974; Lenney, 1977).

The focus of the study reported here is on gender differences in precompetitive state anxiety levels and antecedents. The concept of competitive state anxiety has been studied extensively in sport psychology, but it is widely acknowledged that findings have been equivocal (e.g., Gould, Petlichkoff, & Weinberg, 1984; Martens, Vealey, & Burton, 1990). It has been argued that the reason for this lack of consistency stems from the outdated assumption that anxiety is a unitary concept (Jones & Hardy, 1989; Karteroliotis & Gill, 1987; Parfitt, Jones, & Hardy, 1990). Recently, however, sport psychologists have rejected this oversimplification in favor of a multidimensional approach on the basis that anxiety cannot be sensitively measured if viewed as a global, undifferentiated state. Liebert and Morris' (1967) initial distinction between *worry* and *emotion* components of test anxiety led to Davidson and Schwartz's (1976) widely adopted identification of *cognitive anxiety*, characterized by negative expectations, lack of concentration, and disrupted attention, and *somatic anxiety*, which refers to physical symptoms such as nervousness and tension.

Based on the research of Borkovec (1976) and Morris, Davis, and Hutchings (1981), which supported the existence of these two independent systems of anxiety, Martens, Burton, Vealey, Bump, and Smith (1990) developed a sport-specific questionnaire measure of competitive state anxiety, the Competitive State Anxiety Inventory - 2 (CSAI-2). The CSAI-2 measures cognitive anxiety, somatic anxiety, and self-confidence and has been acknowledged as representing a significant advance in the measurement of competitive state anxiety (e.g., Krane & Williams, 1987). To date, not much research has examined gender differences in the CSAI-2 subscales, but during its validation, Martens et al. (1990) found that females scored higher on cognitive and somatic anxiety and lower on self-confidence than males 1 hour prior to a competition.

The specific purpose of the study was to replicate and extend an investigation by Jones and Cale (1989a) that found differential precompetition temporal patterning of cognitive anxiety, somatic anxiety, and self-confidence in males and females. Jones and Cale's sample comprised male and female subjects drawn from various teams representing the same university who were due to play in the quarter-final stage of the 1988 English and Welsh Universities' Athletic Union Championship. They administered the CSAI-2 (Martens et al., 1990) to the subjects at six stages during the precompetition period: 2 weeks, 1 week, 2 days, 1 day, 2 hours, and within 30 minutes prior to the start of their respective matches.

In the case of cognitive anxiety, males showed no changes during the precompetition period. Females, on the other hand, reported a gradual elevation in cognitive anxiety as the competition neared. The emergence of a gender difference at the within 30 minute stage also revealed that females were more cognitively anxious immediately prior to competition than males. The results for somatic anxiety showed no increases in the males until the day of competition; somatic anxiety in females increased at an earlier stage in the precompetition period. However, no gender differences were evident at any of the stages. Self-

confidence remained stable in males but decreased in females on the day of competition. Furthermore, females exhibited lower self-confidence than males one day before and on the day of competition.

Therefore, the temporal patterning of the CSAI-2 (Martens et al., 1990) subcomponents in males supported multidimensional anxiety predictions that cognitive anxiety and self-confidence remain relatively unchanged during the precompetition period and that somatic anxiety does not increase until just prior to competition (Martens et al., 1990). Support for this patterning is evident in studies carried out on rowers (Ussher & Hardy, 1986), cricket players (Jones, Cale, & Kerwin, 1988), basketball players (Parfitt & Hardy, 1987), field hockey players (Jones & Cale, 1989b), volleyball players (Gould et al., 1984), and wrestlers and gymnasts (Martens et al., 1990).

The temporal patterning for females in Jones and Cale's (1989a) study was contrary to these findings, however, and suggested that females may not conform to the patterning predicted by multidimensional anxiety theory. In a study with female gymnasts, Krane and Williams (1987) also found an increase in cognitive anxiety and a decrease in self-confidence as the competition approached.

Although the findings of Jones and Cale (1989a) revealed interesting gender differences in the temporal patterning of the CSAI-2 (Martens et al., 1990) subscales, they were purely descriptive in nature, and it was not possible to explain them accurately. Consequently, the study reported here examined the reliability of Jones and Cale's findings and investigated situational antecedent variables as the potential source of any gender differences. No research to date has examined possible gender differences in anxiety and self-confidence antecedents, but it has been generally proposed that cognitive anxiety, somatic anxiety, and self-confidence are elicited by different antecedent conditions (Martens et al., 1990).

Somatic anxiety is generally considered to be a conditioned or reflexive response to environmental stimuli associated with competition, such as the competition site. Cognitive anxiety and self-confidence, on the other hand, are more likely to be related to the athlete's perceived ability, which is essentially generated from previous competitive experiences (Feltz, 1984; Gould et al., 1984), performance expectancies (Martens et al., 1990), and perceived readiness (Jones, Swain, & Cale, 1990). Clearly, performance expectancies are mediated by numerous situational factors, including, for example, perceived importance of the competition (Sanderson & Ashton, 1981) and prior knowledge of the opponent's ability (Wandlitzak, Potter, & Lorentzen, 1982).

Gould et al. (1984) considered both situational and personality factors as antecedents of the CSAI-2 (Martens et al., 1990) subscales. They found years of experience to be the strongest predictor of cognitive anxiety. This relationship was negative: Performers with more experience reported less cognitive anxiety. Competitive trait anxiety, as measured by the Sport Competition Anxiety Test (SCAT; Martens, 1977), was also found to be a significant predictor of cognitive anxiety. Perceived ability, on the other hand, was strongly and positively related to the CSAI-2 self-confidence subscale but showed little relationship to the cognitive and somatic anxiety components. The only significant predictor of somatic anxiety was the subject's scores on the SCAT.

The situational variables measured in this study were based on those that previously have been identified as mediating performance expectancies such as

perceived importance of the competition, prior knowledge of the opponent's ability, past performance, expectancy of success, and perceived readiness. Based on the findings of Jones and Cale (1989a), the following hypotheses were examined: (a) cognitive anxiety in females would increase during the precompetition period, but cognitive anxiety in males would remain stable during this time, (b) somatic anxiety in females would increase earlier during the precompetition period than in males, and (c) self-confidence in males would remain stable in the precompetition period, but self-confidence in females would decrease on the day of competition.

Method

Subjects

The subjects for this study were drawn from athletes competing in the 1989 quarter-finals of the English and Welsh Universities' Athletic Union Championship, thus replicating the sampling procedure of Jones and Cale (1989a). The subjects in this study comprised 28 males (M age=21.04; SD 1.67) and 28 females (M age=20.64; SD 1.28). Male subjects comprised field hockey ($n=13$: M age=21.31; SD 1.60) and rugby ($n=15$: M age=20.80; SD 1.74) players; female subjects comprised field hockey ($n=13$: M age=20.23; SD 1.09) and netball¹ ($n=15$: M age=21.00; SD 1.36) players. All subjects had at least 6 years of competitive experience in their respective sports.

Instrumentation

Competitive State Anxiety Inventory-2. Precompetition levels of anxiety and self-confidence were measured via the CSAI-2 (Martens et al., 1990). Gould, Petlichkoff, Simons, and Vevera (1987) stated that recent evidence (Gould et al., 1984; Martens et al., 1990) "has shown that this scale has desirable psychometric properties and is a valid multidimensional measure of state anxiety" (p. 34). Martens et al. (1990), for example, reported internal reliability coefficients ranging from .79 to .90. This scale comprises 27 items, with 9 items in each of the three subscales of cognitive anxiety, somatic anxiety, and self-confidence. Examples of cognitive anxiety items include "I am concerned about this competition" and "I'm concerned about performing poorly"; somatic anxiety items include "I feel nervous" and "my body feels tense." Self-confidence items include "I feel at ease" and "I'm confident about performing well." Responses to each item are on a Likert-type scale ranging from 1 (not at all) to 4 (very much so). Thus, possible scores on each of the three factors range from 9 to 36.

Situational Variables. Six additional items were constructed to measure situational variables. These items were generated based on factors previously identified as mediating performance expectancies and also based on structured interviews with athletes from various sports in which they were asked to identify such factors. The items and response scales are presented in Figure 1.

Procedure

The CSAI-2 (Martens et al., 1990) and the additional items were administered to the subjects at five stages during the precompetition period: 1 week, 2 days, 1 day, 2 hours, and within 30 minutes prior to the start of the competition.

1. How important is it for your team to do well in this match?									
Not at all								Extremely	
important								important	
1	2	3	4	5	6	7	8	9	
2. How important is it for you personally to do well in this match?									
Not at all								Extremely	
important								important	
1	2	3	4	5	6	7	8	9	
3. To what extent do you think that your team will win this match?									
Not at all								Very much so	
1	2	3	4	5	6	7	8	9	
4. In relation to your own team, how do you rate the opposition?									
Much weaker								Much stronger	
1	2	3	4	5	6	7	8	9	
5. How have you been performing in matches over the past few weeks?									
Very poorly								Extremely well	
1	2	3	4	5	6	7	8	9	
6. How prepared (physically and mentally) do you feel for this match?									
Not at all								Extremely	
1	2	3	4	5	6	7	8	9	

Figure 1 — Situational variables: Items and response scales.

Jones and Cale (1989a) had administered the CSAI-2 2 weeks prior to the competition, but this stage of testing was eradicated for the purposes of the study reported here as it was felt that interim results could prove to be a confounding variable. All teams had games just prior to a week before the competition that might have affected responses during the testing period. Practical limitations meant that at the final stage of data collection the subjects did not complete the CSAI-2 at exactly the same time. However, all subjects responded to the questionnaire within 30 minutes prior to the start of their respective matches.

At all stages, the questionnaires were administered by the team captain, coach, or experimenter, using standardized instructions recommended by Martens et al. (1990). The instructions asked the subjects to respond to the questionnaire according to how they felt at that moment about the upcoming match. It was emphasized that there were no right or wrong answers and that they should answer honestly. The subjects were assured of the confidentiality of individual responses.

Table 1
Time-to-Competition Means and Standard Deviations
for CSAI-2 Subscales and Additional Items

Subscales/ additional items		1 week	2 days	1 day	2 hours	<30 min.
Cognitive anxiety						
Males	<i>M</i>	19.04	18.18	18.57	19.07	19.43
	<i>SD</i>	4.38	4.24	4.74	5.06	5.12
Females		19.50	20.07	19.57	21.43	22.86
		5.61	5.71	5.67	6.62	6.72
Somatic anxiety						
Males		11.50	11.21	12.43	15.50	17.50
		2.91	2.28	3.65	5.09	6.57
Females		12.82	11.75	12.04	15.54	19.07
		3.81	3.11	3.06	4.52	4.88
Self-confidence						
Males		29.00	28.82	29.14	27.82	26.71
		4.85	4.33	4.29	5.24	5.40
Females		26.36	27.11	25.89	23.79	22.93
		5.17	4.35	5.14	4.40	4.56
Match importance						
Males		8.61	8.36	8.50	8.71	8.86
		0.96	1.14	0.98	0.44	0.95
Females		8.36	8.07	8.43	8.43	8.61
		0.95	1.95	1.00	1.76	0.54
Indiv. Importance						
Males		8.56	8.11	8.18	8.39	8.61
		0.35	0.81	1.11	0.96	1.44
Females		8.04	7.89	8.04	8.14	8.18
		1.01	0.95	0.92	0.96	1.01
Opposition rating						
Males		3.54	4.07	3.93	3.96	4.07
		1.75	1.72	1.86	1.95	1.11
Females		3.79	4.00	4.00	4.21	4.43
		1.56	2.01	1.95	1.35	1.36
Think win						
Males		7.75	7.68	7.75	7.93	7.82
		1.12	1.08	0.95	0.97	1.15
Females		7.86	7.50	7.50	7.32	7.21
		1.22	1.40	1.44	1.09	1.17
Recent performance						
Males		4.00	4.07	4.14	4.11	4.00
		1.75	1.68	1.44	1.95	1.17
Females		3.71	4.29	4.07	4.05	3.93
		1.64	1.98	1.35	1.62	1.70
Perceived readiness						
Males		6.00	5.75	6.07	5.96	6.00
		1.03	1.26	1.42	1.09	1.50
Females		5.71	5.89	5.57	5.89	5.64
		1.32	1.41	0.96	1.04	1.05

Results

Analyses of Variance

Cognitive anxiety, somatic anxiety, self-confidence, and situational variable scores were compared between the five conditions and between gender by means of two-way analyses of variance (gender by time-to-competition) with repeated measures on the second factor. Follow-up Tukey tests were employed to determine which means significantly differed. Means and standard deviations are presented in Table 1.

Cognitive Anxiety. The gender by time-to-competition interaction for cognitive anxiety was significant, $F(4,216)=2.85$, $p<.05$, and is shown in Figure 2. Cognitive anxiety in the males did not change over the experimental period. In the females, however, cognitive anxiety remained relatively stable over the first 3 stages of testing but then increased significantly at both of the following stages. The results from the follow-up tests on the female sample also showed that cognitive anxiety at the within 30 minutes stage was significantly higher than at the 2 hours stage. A comparison of gender scores at specific stages during the precompetition period showed cognitive anxiety to be higher in females than in males at both the 2 hours and the within 30 minutes stages.

Somatic Anxiety. There was no significant interaction between gender and time-to-competition for somatic anxiety, $F(4,216)=0.90$, $p=.46$, nor was there a significant main effect of gender, $F(1,54)=0.60$, $p=.44$. However, a time-to-competition main effect, $F(4,216)=43.58$, $p<.01$, did emerge. The temporal patterning of males and females revealed that somatic anxiety was higher at the within 30 minutes and the 2 hours periods than at any other time, and it was also higher at the within 30 minutes stage than at the 2 hours stage. Thus,

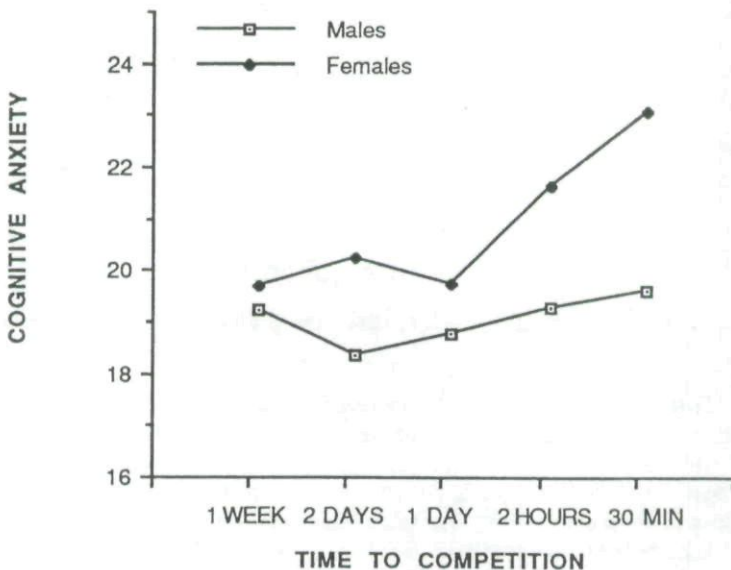


Figure 2 — Gender by time-to-competition patterning of cognitive anxiety.

increases in somatic anxiety in both genders were only evident on the day of competition.

Self-Confidence. The interaction between gender and time-to-competition for self-confidence was marginally significant, $F(4,216)=2.27$, $p<.06$, and is shown in Figure 3. Self-confidence in the males remained stable over the first 3 stages of testing but then decreased significantly at both of the following stages. The results from the follow-up tests on the male sample also showed that self-confidence at the within 30 minutes stage was significantly lower than at the 2 hours stage. Females showed a similar reduction in self-confidence but at an earlier stage in the precompetition period. Specifically, the results showed a progressive decrease from 2 days prior to competition (although it should be noted that there was no significant difference in self-confidence between the 1-week and 1-day precompetition stages). A comparison of gender scores at specific stages during the precompetition period showed self-confidence to be higher in males than females at every stage of testing.

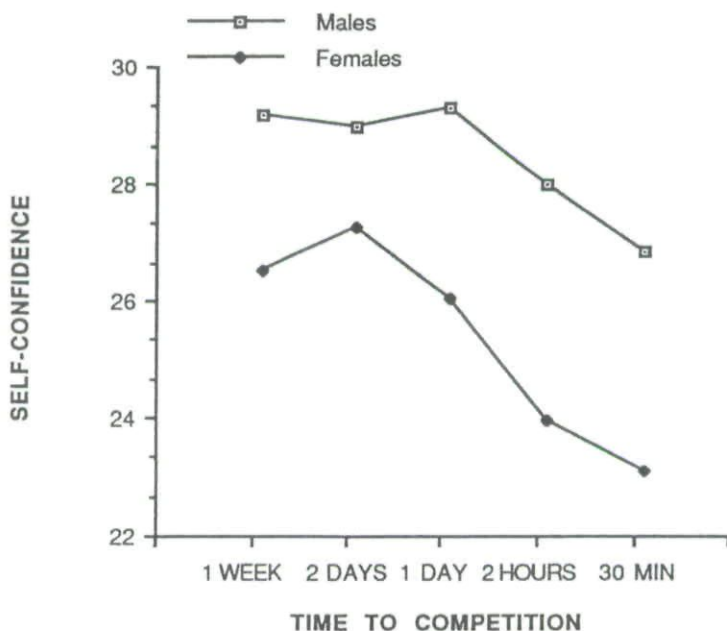


Figure 3 — Gender by time-to-competition patterning of self-confidence.

Situational Variables. Analyses of the additional items measuring situational variables revealed one significant gender by time-to-competition interaction; for the item called "think win" (i.e., "To what extent do you think you will win?"), $F(4,216)=3.53$, $p<.01$. The extent to which males thought they would win remained stable over the experimental period. However, the results revealed a progressive decrease in the females' belief that they could win as the competition neared. Think win was lowest at the 2 hours and the within 30

minutes stages of testing. A comparison of gender scores at specific stages showed think win to be higher in males than females at both the 2 hours and the within 30 minutes stages.

The results showed significant time-to-competition main effects for three of the additional items: match importance, $F(4,216)=6.97$, $p<.01$, individual importance, $F(4,216)=6.01$, $p<.01$, and rating of the opposition, $F(4,216)=4.41$, $p<.01$. As far as match importance was concerned, the temporal patterning of males and females showed a gradual increase in perceptions of the importance of the match from 2 days before to the start of the competition. Match importance was higher at the within 30 minutes stage than at all the other stages of testing. A similar trend emerged in the temporal patterning concerning the importance for the individual to perform well.

Individual importance was significantly higher at the 2 hours before and the within 30 minutes stages than at the 2 days before and the 1 day before competition stages. Rating of the opposition for males and females also tended to increase as the competition approached, with the opposition being rated strongest at the within 30 minutes stage of testing. Rating of the opposition was significantly lower 1 week before the event than at all the ensuing stages of testing.

The analyses of the two remaining additional items, perceived readiness and recent performances in competition, revealed no interactions or significant main effects for either time-to-competition or gender.

Stepwise Multiple Regression Analyses

In order to examine which of the situational variables best predicted each of the multidimensional anxiety components in males and females, separate stepwise multiple regression analyses were performed for each of the time-to-competition stages of testing.² The results showed that different antecedent items predicted the multidimensional anxiety components for males and females.

Cognitive Anxiety. For the females, as Table 2 indicates, the item perceived readiness predicted cognitive anxiety at all five stages of testing. It was the sole predictor on three of these occasions, accounting for 25% of the variance both 2 days before and within 30 minutes of the competition and 21% 1 week before. The relationship was negative in that the greater the perceived readiness, the lower the cognitive anxiety, and vice versa. At the two remaining stages, perceived readiness combined with the item individual importance as a predictor to account for 29% of the variance 1 day before and 42% of the variance 2 hours before; specifically, the greater the perceived individual importance of the competition, the greater was the cognitive anxiety.

Different items emerged as significant predictors of cognitive anxiety in the male subjects. Two days and 1 day before the competition, the items rating of the opposition and match importance combined to account for 29% and 32% of the variance respectively. In both cases, the relationships with cognitive anxiety were positive. However, the sole predictor on the day of competition was the item think win, accounting for 33% of the variance at the 2 hours stage and 26% at the within 30 minutes stage. This relationship was negative in that the greater the confidence of victory, the lower the cognitive anxiety, and vice versa.

Somatic Anxiety. Somatic anxiety was not predicted by any of the additional items for the females, but the item rating of the opposition was significantly

Table 2

**Stepwise Multiple Regression Summary: Significant Predictors
of Cognitive Anxiety, Somatic Anxiety, and Self-Confidence**

	Item	Male		Item	Female	
		R ²	F		R ²	F
Cognitive anxiety 1 week				Perc read	0.21	6.98*
Cognitive anxiety 2 days	Rate opp	0.16	5.00*	Perc read	0.25	8.73**
	Match import	0.29	5.09*			
Cognitive anxiety 1 day	Rate opp	0.20	6.63*	Indiv import	0.15	4.47*
	Match import	0.32	5.89*	Perc read	0.29	5.13*
Cognitive anxiety 2 hours	Think win	0.33	12.67**	Perc read	0.24	7.04*
				Indiv import	0.42	9.21**
Cognitive anxiety <30 min.	Think win	0.26	9.14**	Perc read	0.25	8.42**
Somatic anxiety 1 week						
Somatic anxiety 2 days	Rate opp	0.16	5.03*			
Somatic anxiety 1 day	Rate opp	0.19	6.07*			
Somatic anxiety 2 hours	Rate opp	0.24	8.03**			
Somatic anxiety <30 min.						
Self-confidence 1 week	Perc read	0.39	16.36**			
Self-confidence 2 days	Think win	0.21	6.86*	Perc read	0.23	7.75**
Self-confidence 1 day	Opp rate	0.20	6.53*	Perc read	0.21	6.71*
				Indiv import	0.40	8.43**
Self-confidence 2 hours	Think win	0.29	10.56**	Perc read	0.25	8.43**
				Indiv import	0.56	15.99**
Self-confidence <30 min.	Think win	0.39	16.91**	Perc read	0.20	6.60*
				Indiv import	0.32	5.94*

* $p < .05$; ** $p < .01$.

and positively related to somatic anxiety in males 2 days, 1 day, and 2 hours prior to competition. At the 2 hours before competition stage, 24% of the variance was the most accounted for by this item.

Self-Confidence. Perceived readiness emerged as the major predictor of self-confidence in females at every stage of testing except for 1 week before competing, where no predictors materialized. At 2 hours prior to competition, perceived readiness combined with individual importance accounted for 56% of the total variance. Similarly, these two items combined to account for 32% of the variance at the within 30 minutes stage of testing. The relationship was positive in that the greater the perceived readiness, the greater the self-confidence, and vice versa.

The think win item that was a significant predictor for males of cognitive anxiety also proved to be the primary predictor of self-confidence in males, with the relationship being a positive one. In particular, think win was the sole predictor of self-confidence on the day of competition, accounting for 39% of the explained variance at the within 30 minutes stage of testing and 26% at the 2 hours before competition stage.

Discussion

This study represented a replication and extension of Jones and Cale's (1989a) examination of gender differences in the precompetition temporal patterning of cognitive anxiety, somatic anxiety, and self-confidence. It also examined situational factors that might be associated with any gender differences. The results for cognitive anxiety were very similar to those of the original study and essentially supported the first hypothesis. For the male subjects, cognitive anxiety remained stable over the experimental period. Cognitive anxiety in the females, on the other hand, remained stable over the first 3 stages of testing and then significantly increased on the day of competition. This finding differs slightly from Jones and Cale, who reported a progressive increase in female cognitive anxiety throughout the precompetition period. Despite this small difference in the temporal patterning for the females, the results offer further support that differential temporal patterning of cognitive anxiety may exist between males and females.

The findings for somatic anxiety did not endorse the differential patterning in Jones and Cale's (1989a) study and thus failed to support the second hypothesis. In the study reported here, both genders followed the same patterning, with increases only in evidence on the day of competition. The marginally significant interaction that emerged for self-confidence in this study revealed similar, but not identical, findings to the original investigation and thus partially supported the third hypothesis. Females again reported progressive reductions in self-confidence from the 2 days before stage, but male self-confidence also decreased on the day of competition instead of remaining stable.

In summary, these results do not exactly replicate Jones and Cale's (1989a) findings. Although the discrepancies in the findings of the two studies are somewhat difficult to explain, they do, nonetheless, offer further support that cognitive anxiety and self-confidence follow a differential precompetition patterning in males and females. One possible explanation may be that the nature of Jones and Cale's sample differed slightly from the sample in the study reported here: That is, Jones and Cale's sample included subjects from an individual sport (squash), and, due to practical considerations, the present study included only subjects from team sports. The notion that precompetition temporal patterning of anxiety and self-confidence may vary as a function of type of sport warrants further investigation.

In addition to the differential precompetition temporal patterning of cognitive anxiety and self-confidence, the results of the regression analyses showed that different factors predicted cognitive anxiety, somatic anxiety, and self-confidence in males and females. For the males, the items think win, rating of the opposition, and match importance emerged as the significant predictors of cognitive anxiety. Think win was a predictor at both stages on the day of competition, and the other two items combined as predictors 2 days and 1 day prior to competition. For somatic anxiety, on the other hand, rating of the opposition emerged as a predictor on three occasions. Self-confidence in males was most frequently predicted by the item think win, which was again the sole predictor on the day of competition itself, as it had been for cognitive anxiety.

In the case of the females, cognitive anxiety was predicted by perceived readiness at every stage of testing and also by individual importance at 1 day and

at 2 hours before the competition. However, no significant predictors were found for somatic anxiety at any stage. Female self-confidence, on the other hand, was significantly predicted by perceived readiness and individual importance. These two items combined as predictors at each of the last three stages of testing. In other words, the same antecedents emerged as predictors of both cognitive anxiety and self-confidence for the female subjects.

A possible explanation for the emergence of the perceived readiness and individual importance items as predictors for females and not for males in this particular study could be related to gender differences in sport orientation and reasons for participation. Gill (1988) suggested that females seem to focus more on personal goals and standards whereas males focus more on interpersonal comparison and winning. Hence, items that ask the athlete to evaluate the suitability of his or her physical and mental preparation and that ask how important it is personally for them to do well, because of their personal nature, would be more expected to relate to cognitive anxiety and self-confidence in females than in males. Gill's proposal is further supported by the appearance of the think win item as the major predictor of cognitive anxiety and self-confidence in males. Such an item, because it focuses on interpersonal comparison and winning, would be more expected to relate to cognitive anxiety and self-confidence in males than in females.

The findings for somatic anxiety are somewhat surprising, with rating of the opposition predicting somatic anxiety in males at three of the five stages of testing. No other situational variable predicted somatic anxiety in males. Furthermore, no predictors of somatic anxiety emerged at any stage in the females. Multidimensional anxiety theory suggests that perception of opponent's ability should be related to cognitive anxiety rather than somatic anxiety as it represents an item that concerns expectations of success. However, simply thinking about the opposition when completing the questionnaire could provoke an increase in the somatic anxiety response because the athlete may mentally picture himself at the competition site. The athlete may, therefore, be subconsciously exposing himself to the environmental stimuli that are thought to elicit a somatic response.

These findings concerning the largely nonsignificant relationships between somatic anxiety and the additional items can possibly be further explained by the nature of the items themselves. The majority of the six items were items that one would expect to relate to cognitive anxiety and/or self-confidence. Martens et al. (1990) indicated that somatic anxiety is a reflexive response to environmental stimuli associated with the onset of an evaluative event and is elicited by factors such as perception of playing conditions, crowds, and game importance. Of the additional items administered in this study, therefore, match importance was the only one that could be included as an antecedent expected to predict somatic anxiety, and this did not emerge as a significant predictor.

The findings of this study may have important implications at an applied level for coaches and performers involved in team sports. In particular, they suggest that favorable perceptions of readiness correspond to lower levels of cognitive anxiety and higher self-confidence in females and that expectations of success have the same influence on males. Therefore, coaches can assist female athletes by structuring training programs so that they come to perceive themselves as being physically and mentally ready. Similarly, male athletes would

appear to benefit from precompetition preparations that stress the team's ability to win.

In summary, the findings from this study support the notion of differential temporal patterning of the multidimensional anxiety components in males and females. They also suggest that the antecedents of cognitive anxiety, somatic anxiety, and self-confidence may differ between males and females. Clearly, in order to maximize the use of appropriate intervention techniques, further research needs to be carried out to establish whether different antecedents predict anxiety at different times in the crucial phase prior to competition.

Furthermore, the sparsity of research alluded to earlier in this paper in reference to potential gender differences in anxiety and self-confidence antecedents can equally be applied to our understanding of other factors that may influence the predictors of competitive state anxiety. For example, the literature would undoubtedly benefit from an examination of whether the antecedents differ depending on the nature of the sport concerned. Martens et al.'s (1990) classification of sports into objective versus subjective, individual versus team, and contact versus noncontact may provide a suitable framework for such an investigation.

Similarly, researchers may also wish to consider whether the antecedents of anxiety and self-confidence differ as a function of skill level. Several studies have found differing levels of anxiety (e.g., Martens et al., 1990) and differential temporal patterning (e.g., Fenz, 1975; Mahoney & Avenier, 1977) between highly skilled and less skilled performers. Whether the precursors of this anxiety vary according to the performer's experience or stage of learning is a further area for investigation.

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Notes

¹Netball is a 7-a-side invasion game in which points are scored by propelling a ball into an elevated basket in a fashion similar to basketball.

²It should be emphasized that the sample size for such an analysis is relatively small but does satisfy Tabachnick and Fidell's (1983) recommendation that when using stepwise regression analyses the number of subjects should be at least four or five times as large as the number of variables.

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