

Temporal Aspects of Competitive Anxiety and Self-Confidence as a Function of Anxiety Perceptions

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Competitive anxiety and self-confidence were examined temporally in “facilitators,” “debilitators,” and “mixed interpreters” using the modified CSAI-2 (intensity, direction, frequency). MANOVA’s (group $\times$ time-to-competition) and follow-up tests revealed no significant interactions but revealed significant main effects for both factors. Facilitators displayed increased intensities of self-confidence, more positive interpretations of cognitive and somatic symptoms, increased frequency of self-confidence, and decreased frequency of cognitive symptoms than debilitators through performance preparation. Time-to-competition effects indicated intensities of cognitive and somatic responses increased, and self-confidence decreased near competition. Directional perceptions of cognitive and somatic responses became less positive, and the frequency of these symptoms increased toward the event. Findings have implications for intervention design and timing and emphasize the importance of viewing symptoms over temporal phases.

Understanding temporal changes in athletes’ precompetitive symptoms is vital for the applied practitioner assisting preparation in the time leading up to competition (Cerin, Szabo, Hunt, & Williams, 2000; Hanton, Mellalieu, & Young, 2002). Specifically, when designing psychological interventions, the practitioner needs to consider reactions to competition as temporal events in order to identify appropriate prescriptive points for intervention as competition approaches (Mellalieu, 2003). Traditionally, these interventions are intended to regulate or protect against negative symptoms that may debilitate future performance (Hanton et al., 2002; Mellalieu, 2003). One potentially debilitative symptom that has received

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extensive empirical research attention is that of multidimensional competitive anxiety (Martens, Burton, Vealey, Bump, & Smith, 1990).

Typically, using the Competitive State Anxiety Inventory-2 (CSAI-2), research has assessed the temporal patterns of symptom intensity at set time-to-event intervals usually focused around 7 days, 48 hr, 24 hr, and 1 hr precompetition (see Cerin et al., 2000 for review). Multidimensional anxiety theory (MAT) predicts that if evaluation of performance expectancy remains unchanged, the intensity of both cognitive anxiety and self-confidence should remain stable in the week preceding competition (Martens et al., 1990). Somatic anxiety is proposed to remain stable initially but show a sharp increase and reach its peak at the onset of competition before dissipating once the event begins (Martens et al., 1990). Although empirical support for these predictions has been forthcoming (e.g., Gould, Petlichkoff, & Weinberg, 1984), the literature base remains equivocal (Cerin et al., 2000). For example, researchers have noted increases or decreases in cognitive and self-confidence symptoms as competition approached (e.g., Hanton, Thomas, & Maynard, 2004). One reason for these inconsistencies could rest with the somewhat limited approach of only assessing symptom intensity without considering additional dimensions such as frequency and direction (Jones, 1995; Woodman & Hardy, 2001).

The dimension of frequency was described the amount of time an athlete spent attending to the symptoms experienced concerning competition (Swain & Jones, 1993). Rationale for its importance emanates from two sources. First, mainstream emotional affect researchers have argued that individuals are more able to accurately recall and report frequency of affect than intensity of affect (Diener, Sandevik, & Pavot, 1991; Kardum, 1999). Second, and specific to temporal competitive anxiety research, Jones (1995) and Swain and Jones argued that a state where worries about competition remained at a consistent level (i.e., intensity) throughout a one-week precompetition period did not equate to a true cognitive state; it merely referred to the same level at two different times without providing reference to how often these symptoms were actually experienced (i.e., frequency). To investigate this concept, Swain and Jones added a continuum to each CSAI-2 item asking "How frequently do you experience this thought or feeling at this stage?" and established that although intensities of anxiety components supported MAT, frequency of symptoms increased significantly through the 48 hr preceding competition (48 hr, 24 hr, 2 hr, 30 min). Swain and Jones noted that frequency appeared more sensitive to temporal changes than intensity and concluded that states where anxiety symptoms occur for 5% of the time are considerably different from those where they are experienced 90% of the time. However, despite these encouraging initial results, further research into the frequency dimension remains limited.

The dimension of direction was described as athletes' interpretation of their cognitive and somatic symptom intensity as either positive or negative toward subsequent performance (Jones & Swain, 1992). Over the last ten years, a growing body of research has supported the distinction between intensity and direction through examining both personal and situational variables such as skill level (Jones, Hanton, & Swain, 1994; Jones & Swain, 1995), sporting performance (Jones, Swain, & Hardy, 1993), competitiveness (Jones & Swain, 1992), antecedents of competitive anxiety (Hanton & Jones, 1997), psychological skill use (Fletcher &

Hanton, 2001), sport type classification (Hanton, Jones, & Mullen, 2000), hardiness (Hanton, Evans, & Neil, 2003), and gender (Perry & Williams, 1998). However, research examining possible temporal patterns in the direction dimension has remained scarce.

Wiggins (1998) examined the time-to-event fluctuations of intensity and direction through a 24-hr precompetition period (24 hr, 2 hr, 1hr). Temporal patterns for intensity supported the predictions of MAT, but no significant time-to-competition changes emerged for direction. It was concluded that early indications suggested once athletes had appraised their anxiety symptoms as either facilitative or debilitating toward performance, this interpretation remained consistent prior to competition. However, Wiggins noted that using a 24-hr precompetition period limited the change-over-time effects that could occur in any dimension of competitive anxiety.

To date, literature addressing the temporal patterning of symptom responses highlights several weaknesses. First, limited research has examined temporal patterns in the additional dimensions of frequency and direction. Further, the work that has considered such research questions (i.e., Swain & Jones, 1993; Wiggins, 1998) has utilized temporal periods of limited scope (i.e., within 48 hr to 24 hr precompetition). Additionally, these studies only investigated two of the three dimensions within one research design. As noted by Woodman and Hardy (2001), researchers examining the mechanisms surrounding athletes' responses to competitive stress should view responses through a more "fine grained" measurement approach including the separate dimensions of intensity, direction, and frequency.

Recently, Hanton et al. (2004) addressed these criticisms and examined the temporal patterns of symptom intensity, direction and frequency in a 7-day precompetition phase (7 days, 48 hr, 24 hr, 2 hr, 30 min) with respect to the moderating variable of skill classification (elite versus non-elite). Findings indicated skill level differences were only noted in the direction dimension where elite performers were more facilitative in their interpretation of cognitive and somatic symptoms through the week preceding competition. Further, no interactions were found across the data set indicating that the symptom responses of elite and nonelite performers followed similar patterns as competition approached. Finally, time-to-competition effects were observed in the dimensions of intensity and frequency, where cognitive and somatic intensity increased between 2 hr and 30 min before competition, and self-confidence intensity decreased between such times. Greater temporal changes were noted in the frequency dimension, where cognitive frequency increased between 7 days and 48 hr, 24 hr and 2 hr, and 2 hr and 30 min precompetition, somatic frequency increased between 7 days and 48 hr and 48 hr and 30 min precompetition and self-confidence frequency increased between 7 days and 48 hr precompetition. This greater time-to-competition sensitivity in the frequency or responses prompted Hanton et al. to call for further research into the temporal patterns of the competitive anxiety dimensions (intensity, direction, and frequency) stating these issues are important for the practitioner when preparing athletes in the time leading up to competition. Specifically, identification of potential changes in perceptions of anxiety symptoms (e.g., positive to negative) and knowledge of the precompetition time periods where the frequency of time spent thinking about or experiencing negative symptoms increases could provide support for the timing of psychological interventions during preparation. Additionally, Hanton

et al. suggested the use of potentially more sensitive grouping variables capable of influencing time-to-competition changes in the dimensions of competitive anxiety.

Pointing to the research of Jones and Hanton (2001), Hanton et al. (2004) proposed that directional perceptions (i.e., facilitative versus debilitative) could influence temporal changes in competitive anxiety symptoms. Jones and Hanton's research noted differences in the intensity and direction of anxiety symptoms and differences in the affective labels experienced (i.e., idiographic thoughts and feelings perceived as positive or negative toward performance) between athletes who interpreted their immediate preevent anxiety symptoms as facilitative or debilitative toward performance. Hanton et al. noted that their own research, and previous investigations assessing time-to-event changes in the additional dimensions (i.e., Swain & Jones, 1993; Wiggins, 1998), had only used populations described as "facilitators" (i.e., athletes with a positive interpretation of both cognitive and somatic anxiety symptoms) and not considered "debilitators" (i.e., athletes with a negative interpretation of both cognitive and somatic anxiety symptoms) or "mixed interpreters" (i.e., athletes with a mixed positive and negative interpretation of their cognitive and somatic anxiety symptoms). Although not addressed in sport psychology, mainstream anxiety researchers have examined symptom changes in students debilitated (debilitators) and facilitated (facilitators) by their preexam responses (Raffety, Smith, & Ptacek, 1997). Specifically, group differences indicated debilitators showed higher intensities and frequencies of worry and tension in the 7 days preceding the test. Raffety et al. concluded that not only were the debilitators interpreting their preexam symptoms as more negative toward performance, they were also thinking about them more frequently and experiencing greater levels of them (i.e., intensities) in the time leading up to the exam.

This study aimed to extend the knowledge base on time-to-competition patterns of competitive anxiety symptoms, with particular reference to the direction and frequency dimensions. The study integrated the use of "interpretation" as a potential influencing variable over intensity, direction, and frequency of cognitive, somatic, and self-confidence symptoms. Tentative hypotheses were formulated for group effects based on the associated research programs of Jones and Hanton (2001) and Raffety et al. (1997). For intensity, it was hypothesized that facilitators would experience higher levels of self-confidence than debilitators through the precompetition period. For direction, it was proposed that facilitators would view their cognitive and somatic intensities as more positive toward performance than debilitators in the 7 days leading up to competition. Finally, for frequency, it was predicted that facilitators would experience lower frequencies of cognitive and somatic symptoms than debilitators during the time leading up to competition. The lack of previous empirical research considering mixed interpreters as a group, or self-confidence frequency as a concept, resulted in no group effect hypotheses being proposed for these variables. Time-to-competition hypotheses were based on Martens et al.'s (1990) work for the intensity dimension, Hanton et al. (2004) and Wiggins (1998) for the direction dimension, and Hanton et al. (2004) and Swain and Jones (1993) for the frequency dimension. Specifically, it was proposed that cognitive anxiety and self-confidence intensity would remain stable in the time leading up to competition where as somatic intensity would increase just prior to competition. For the direction dimension it was proposed that no change over time

effects would be noted. Finally, for the frequency dimension, it was suggested that cognitive and somatic symptoms would increase as the competition moved closer but self-confidence would remain stable.

Method

Participants

Following preexperimental selection (see procedure section), sixty performers ($n = 31$ males; $n = 29$ females) were purposively selected to participate in the study. The athletes' competitive status was either regional ($n = 28$) or national standard ($n = 32$) with an age range of 18 to 38 years ($M = 22.15$, $SD = 4.64$). The sample comprised team and individual performers derived from field hockey ($n = 26$), rugby union ($n = 16$), soccer ($n = 8$), athletics ($n = 6$), and swimming ($n = 4$).

Measures

Modified Competitive State Anxiety Inventory-2 (CSAI-2). The CSAI-2 (Martens et al., 1990) measured precompetitive cognitive anxiety, somatic anxiety, and self-confidence and was modified to include scales accounting for the dimensions of direction (Jones & Swain, 1992) and frequency (Swain & Jones, 1993). The inventory calculates symptoms via 27 items, 9 per construct. Intensities were marked on a 1 (*not at all*) to 4 (*very much so*) scale. Directions were scored on a -3 (*very debilitating: negative*) to $+3$ (*very facilitative: positive*); 0 = *unimportant interpretation* continuum. Frequencies were recorded on a 1 (*never*) to 7 (*all of the time*) scale. Therefore, intensities ranged from 9 to 36, directions from -27 to $+27$ and frequencies from 9 to 63 across each construct. Internal reliability scores (Cronbach alpha's) for the intensity scale range from .79 to .90 (Martens et al., 1990) and from .72 to .89 for the direction scale (Hanton et al. 2000; Jones & Hanton, 1996). The limited research attention on the frequency dimension resulted in no internal reliability scores being available for the scale, therefore these were calculated as part of the study.

Modified Competitive Trait Anxiety Inventory-2 (CTAI-2). The CTAI-2 (Albrecht & Feltz, 1987), modified to include scales for direction (Jones & Swain, 1995), was utilized to aid group selection via symptom interpretation. The item structure and response format of the CTAI-2 remains identical to that of the CSAI-2. However, Albrecht and Feltz modified the instructional set of the scale to explore how the individual usually feels about competition, creating a general trait measure. Further modifications to the CTAI-2 have included the addition of a direction scale (Hanton & Jones 1999a, 1999b; Jones & Swain, 1995; Perry & Williams, 1998). In line with previous studies using the CTAI-2 to determine group selection through interpretation of cognitive and somatic anxiety, the self-confidence scale of the inventory was removed (Hanton & Jones, 1999a, 1999b; Jones & Swain, 1995). Therefore, the CTAI-2 totalled 18 items across the dimensions of intensity and direction. Internal reliability coefficients for the modified CTAI-2 are cited to range from .78 to .84 (Perry & Williams, 1998).

Procedure

Preexperimental Procedure: Group Selection. Four national level sports clubs gave permission for performers within their organization to be approached.

Introductory sessions were held at each separate club where potential participants were briefed about the procedures and timetable of research. Following this, volunteers who agreed to participate provided written consent to be involved.

Group selection resulted from a prescreening data collection at both the trait and state level. As such, the CTAI-2 (with the self-confidence scale removed) modified to include intensity and direction was completed during the initial contact session. All CTAI-2 completions took place at least four days prior to the participants' next competitive fixture to avoid carryover effects of state responses. The CSAI-2 (with the self-confidence scale removed) modified to include intensity and direction scales was distributed 1 hr prior to the participants next national or regional competitive fixture by the first author.

In line with procedures adopted by Jones and Hanton (2001) and Hanton and Jones (1999a, 1999b), interpretational group selection resulted from criterion scores on the two anxiety inventories (trait and state). Participants were classified a debilitator through scoring a negative interpretation score on both the trait and state inventories for both cognitive and somatic scales, a facilitator through reporting a positive interpretation on both the trait and state inventories across both constructs, or a mixed interpreter through reporting a combination of negative and positive interpretations across both trait and state measures. The preexperimental procedures realized a participant pool containing three distinct groups separated by interpretations (both trait and state) of cognitive and somatic symptoms namely, facilitators ($n = 28$), debilitators ($n = 20$), and mixed interpreters ($n = 35$). In order to best suit the statistical assumptions associated with the data analysis procedure of MANOVA (see data analysis section), Tabachnick and Fidell (1996) advocated an equal number of participants in each group. Therefore, the SPSS (11.0) select case, random sample function, was used to randomly delete cases to attain groups with equal size. This realized a population containing a total of 60 participants across the interpretational groups of facilitators ($n = 20$), debilitators ($n = 20$), and mixed interpreters ($n = 20$).

Experimental Procedure. Data was collected at four precompetition stages (7 days, 48 hr, 24 hr, 1 hr) using the modified CSAI-2 in the lead up to a national or regional competitive fixture. For the intensity scale, participants followed the standardized guidelines of Martens et al. (1990) with the response set of "how you feel right now in relation to your upcoming competition." For the direction scale, performers recorded whether their symptom intensities were interpreted as facilitative or debilitative toward upcoming performance. Finally, to ensure standardization of time frame reference for frequency ratings, participants recorded how frequently they had experienced the cognitive, somatic, and confidence symptoms since the time they were last sampled. These instructions were provided in a briefing session at the 7-day precompetition time period, during which data for this phase were collected. The first author also distributed and was present for data collected at the 1-hr precompetition phase. These processes minimized social desirability concerns at these precompetition phases. Typed instructional sets were distributed with the CSAI-2s for the 48-hr and 24-hr precompetition time periods. Although none of the authors were present for these data collections, each participant was telephoned at the applicable phase as a reminder complete the CSAI-2.

Data Analysis

Data analysis was divided into three sections. First, reliability scores of the CSAI-2 scales were computed alongside correlation coefficients between the dimensions

assessing their independence. Second, data were prescreened for statistical assumptions and possible influences of gender and skill level over anxiety and confidence scores. Finally, group $\times$ time-to-competition (3×4) MANOVAs (repeat measures on the second factor) tested whether facilitators, debilitators, and mixed interpreters showed similar temporal patterns.

Results

Internal Reliability and Correlational Analysis

Reliability scores are reported in Table 1 and ranged from .70 to .93 for the intensity dimension and from .86 to .90 for the direction dimension consistent with previous research (Hanton et al., 2000; Martens et al., 1990). To the authors knowledge, no previous research has calculated reliability scores for the frequency dimension. However, those noted here ranged from .87 to .93 indicating internal consistency. Correlation coefficients between the dimensions are highlighted in Table 2 and indicated a maximum shared variance of 30%, supporting proposals for separate measurement of the dimensions (Hanton et al., 2000; Hanton et al., 2004).

Data Prescreening

Data were tested for missing cases, distributions, and assumptions of univariate and multivariate analyses (Field, 2000; Tabachnick & Fidell, 1996). No missing cases and univariate or multivariate outliers were identified (Mahalanobis distance test). Further, assumptions of normality, linearity, multicollinearity, and singularity were met. However, although satisfactory at the univariate level (Levene's test and $F_{\max}$ ratios), equality of covariance matrices was violated in some cases at the multivariate

Table 1 CSAI-2 Internal Reliability Coefficients (Cronbach Alpha)

Symptom	7 Days	48 hr	24 hr	1 hr
Intensity				
Cognitive	.83	.88	.86	.89
Somatic	.70	.73	.83	.92
Self-confidence	.88	.93	.90	.93
Direction				
Cognitive	.86	.87	.88	.90
Somatic	.90	.89	.90	.86
Self-confidence	.93	.94	.89	.92
Frequency				
Cognitive	.91	.91	.89	.92
Somatic	.93	.92	.91	.90
Self-confidence	.87	.92	.88	.90

Note. CSAI-2 = Competitive State Anxiety Inventory-2

Table 2 Interrelationships Between the CSAI-2 Dimensions

Component/Time	Correlations (% common variance)		
	CA	SA	SC
Intensity - Direction			
7 days	−0.31 (9%)	−0.24 (6%)	0.51 (26%)
48hr	−0.27 (7%)	−0.28 (8%)	0.53 (28%)
24hr	−0.22 (5%)	−0.23 (5%)	0.49 (24%)
1hr	−0.33 (11%)	−0.25 (6%)	0.50 (25%)
Intensity - Frequency			
7 days	.292 (8%)	.287 (8%)	.301 (19%)
48hr	.214 (5%)	.311 (10%)	.519 (26%)
24hr	.397 (16%)	.418 (17%)	.551 (30%)
1hr	.406 (17%)	.377 (14%)	.508 (25%)

Note. CSAI-2 = Competitive State Anxiety Inventory-2

level (Box's test). Therefore, Pillai's trace was selected as the multivariate test statistic due to its robustness over violations and recommendation when sample sizes are equal (Field, 2000; Tabachnick & Fidell, 1996).

Influence of Gender and Skill Level

Nonsignificant effects were noted in the MANOVAs testing the influence of gender on intensity, Pillai's trace = .276, $F(12, 47) = 1.496$, $p > .05$; direction, Pillai's trace = .276, $F(12, 47) = 1.489$, $p > .05$; and frequency, Pillai's trace = .210, $F(12, 47) = 1.040$, $p > .05$ and skill level on intensity, Pillai's trace = .181, $F(12, 47) = .868$, $p > .05$; direction, Pillai's trace = .192, $F(12, 47) = .931$, $p > .05$; and frequency, Pillai's trace = .250, $F(12, 47) = 1.302$, $p > .05$. These findings enabled the collapsing of data across gender and skill level.

Multivariate Analysis of Variance

In total, three MANOVA were computed, one for each dimension of intensity, direction, and frequency. Therefore, the alpha level for each was adjusted to .017, .003, and .0003, respectively, using the Bonferroni correction. Across all three MANOVAs no interactions were noted ($ps > .017$). The failure to find any significant interactions suggested similarities among the groups for their time-to-competition pattern changes. The identification of significant multivariate main effects was followed with two-way mixed design ANOVAs testing for between-subject grouping differences and within-subject repeated measures of time-to-competition. Effect size values (d) were calculated to indicate the practical significance of any statistical effects using the procedures outlined by Mullineaux, Bartlett, and Bennett (2001). Bonferroni corrected t tests followed any significant between and within effects in the ANOVA models testing pairwise comparisons (Field, 2000; Tabachnick & Fidell, 1996). The assumption of sphericity was violated

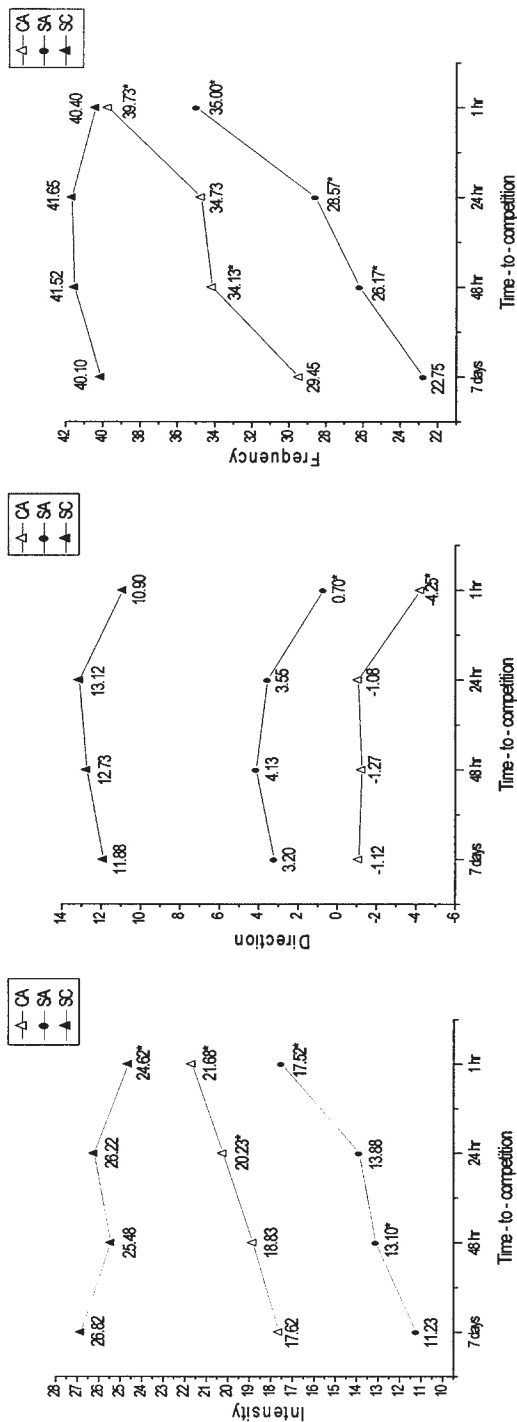
in some cases in the within-subject repeated measures analyses. Therefore, the Green-House Geisser correction factor was applied for subsequent *F* statistic calculation (Field, 2000; Tabachnick & Fidell, 1996).

Intensity Dimension. Main effects were noted in the intensity dimension for group effects, Pillia's trace = .229, $F(6, 112) = 2.42$, $p < .017$, with follow-up between-subject ANOVA indicating differences were observed for self-confidence, $F(2, 57) = 6.70$, $p < .01$, $d = 1.07$. Corrected *t* tests indicated facilitators experienced greater intensity of self-confidence symptoms than debilitators through the 7 days preceding competition (Table 3). Time-to-competition main effects were also noted in the intensity dimension, Pillia's trace = .248, $F(9, 49) = 16.54$, $p < .0003$, with follow-up within-subject ANOVAs revealing changes for cognitive anxiety, $F(2, 139) = 24.22$, $p < .001$, $d = .16$; somatic anxiety, $F(2, 104) = 68.59$, $p < .001$, $d = .41$; and self-confidence, $F(2, 143) = 5.44$, $p < .01$, $d = .17$. Corrected *t* tests indicated cognitive anxiety intensity increased progressively from 48 hr before competition, somatic anxiety intensity increased between 7 days and 48 hr and 24 hr and 1hr before the event, and self-confidence intensity decreased between 24 hr and 1hr before competition (Figure 1).

Direction Dimension. Main effects were noted in the direction dimension for group effects, Pillia's trace = .690, $F(6, 112) = 9.84$, $p < .0003$, with follow-up between-subject ANOVA indicating differences were observed for cognitive, $F(2, 57) = 32.40$, $p < .001$, $d = 2.04$ and somatic anxiety, $F(2, 57) = 18.81$, $p < .001$, $d = 1.59$. Bonferroni corrected *t* tests suggested facilitators were more positive in their interpretation of cognitive anxiety than debilitators and mixed interpreters through the precompetition period (Table 3). Additionally, facilitators and mixed interpreters were more positive in their interpretation of somatic anxiety than the debilitators through the 7 days preceding the event (Table 3). Time-to-competition main effects were also observed in the direction dimension, Pillia's trace = .374, $F(9, 49) = 3.25$, $p < .017$, with follow-up within-subject ANOVA indicating changes for cognitive, $F(3, 151) = 5.82$, $p < .01$, $d = .31$ and somatic anxiety, $F(3, 150) = 5.09$, $p < .01$, $d = .37$. Bonferroni corrected *t* tests indicated the directional perception of both cognitive and somatic anxiety became more negative (or less positive) between

Table 3 Significant Group Main Effect Summaries

Dimension Symptom	Facilitator M (SD)	Debilitator M (SD)	Mixed M (SD)
Intensity			
Self-confidence	28.76 (4.38)	23.10 (7.29)	25.49 (4.25)
Direction			
Cognitive	7.13 (6.08)	-8.15 (9.26)	-4.73 (7.10)
Somatic	8.66 (7.85)	-3.75 (8.33)	3.78 (7.21)
Frequency			
Cognitive	28.99 (11.84)	38.58 (12.69)	35.98 (10.44)
Self-confidence	43.90 (10.73)	37.03 (10.83)	41.83 (8.10)



Note. CA = Cognitive anxiety; SA = Somatic anxiety; SC = Self-confidence; * = Significant change from previous time period.

Figure 1 — Time-to-competition changes across the anxiety dimensions.

24hr and 1hr precompetition (Figure 1).

Frequency Dimension. Main effects were observed in the frequency dimension for group effects, Pillia's trace = .289, $F(6, 112) = 9.84$, $p < .017$, with follow-up between-subject ANOVA indicating differences were observed for cognitive anxiety, $F(2, 57) = 4.59$, $p < .01$, $d = .82$ and self-confidence, $F(2, 57) = 3.61$, $p < .05$, $d = .69$. Bonferroni corrected t tests suggested facilitators experienced less frequency of cognitive symptoms and greater frequency of self-confidence symptoms through the precompetition period in comparison to debilitators (Table 3). Time-to-competition main effects were also noted: Pillia's trace = .591, $F(9, 49) = 7.87$, $p < .0003$ with follow-up within-subject ANOVA indicating changes for cognitive, $F(2, 116) = 25.23$, $p < .001$, $d = .24$ and somatic anxiety, $F(2, 116) = 38.80$, $p < .001$, $d = .97$. Bonferroni corrected t tests suggested frequency of cognitive symptoms increased between 7 days and 48 hr and 24 hr and 1 hr preceding competition, whereas frequency of somatic symptoms increased progressively through each stage of the preevent period (Figure 1).

Discussion

This study highlighted the importance of examining the dimensions (intensity, direction, frequency) of competitive anxiety during the preparation time for competition. At a theoretical level, the correlation analyses underlined the importance of measuring the dimensions separately. Coefficient values between intensity and direction supported those reported in the temporal study of Hanton et al. (2004) and those noted by Hanton et al. (2000) and Jones and Hanton (2001) for times immediately before competition. Comparisons between intensity and frequency dimensions strengthened the argument to include assessments of frequency information. Specifically, throughout preparation time for competition, cognitive and somatic anxiety shared a maximum common variance of 17%, whereas self-confidence shared a maximum of 30%. These findings reinforced the results of Hanton et al. (2004) and emotionalists views for the separation of intensity and frequency when examining affect responses (Diener et al., 1991; Kardum, 1999). Additionally, the reliability analyses supported the psychometric properties of the modified CSAI-2. Importantly, the previously untested internal reliability of the frequency scale was upheld. These results suggest psychologists should use a fine-grained measurement approach within competitive anxiety research (Woodman & Hardy, 2001).

The between-subjects group findings supported and extended the differences noted between athletes with facilitative and debilitative interpretations of anxiety. Specifically, supportive of the proposed hypothesis, and with a large effect size (1.07), facilitators experienced higher intensities of self-confidence than debilitators through the time preceding competition. Previous research has indicated facilitators experience higher levels of trait self-confidence (Perry & Williams, 1998) and report the affective feeling state label "confident" more often than debilitators to describe how they feel immediately before competing (Jones & Hanton, 2001). However, a limitation of the above research was the use of a single confined measurement point approximately 1hr to 30 min precompetition. The results of this study extend these differences through a 7-day precompetition period and combined with the trait findings of Perry and Williams suggest these differences appear relatively stable.

Group differences observed for the direction dimension supported the

proposed hypothesis and emphasized the group membership selection process conducted in the preexperimental procedure. Specifically, with a very large effect size (2.04), debilitators and mixed interpreters were more negative in their perception of cognitive anxiety than facilitators through the precompetition period. Further, with very large effect size (1.59), the debilitators were more negative in their interpretation of somatic anxiety than the facilitators and mixed interpreters were through the 7 days preceding competition.

However, probably the most interesting findings for group differences were observed in the frequency dimension. Specifically, debilitators experienced greater frequency of cognitive symptoms ($d = .82$) and lower frequency of self-confidence symptoms ($d = .69$) than the facilitators throughout the preparation time for competition. Therefore, not only were debilitators interpreting their cognitive symptoms as negative toward performance, they were actually thinking about these symptoms more often as competition neared. Although unique findings within sport psychology, these results are analogous to the test anxiety research of Raffety et al. (1997), in which debilitators experienced greater frequency of worry in the 7 days leading up to a mid-term exam. However, in contrast to the proposed hypothesis of this study, no differences were noted between the groups for frequency somatic symptoms. This hypothesis was based on the differences noted in tension between debilitators and facilitators in Raffety et al.'s work. Failure to support the hypothesis could be attributed to task characteristics in that the role of tension before an exam is far removed from the role of perceived physical arousal prior to competitive sport. The majority of participants in this study were involved in contact sports, therefore it is not unrealistic for performers to be thinking about these symptoms in the time preceding the event, irrespective of whether they regard them as positive or negative toward performance.

Group findings for self-confidence frequency are also informative. No hypothesis was proposed for group differences due to the lack of sport psychology research dealing with response frequency and a lack of consideration to self-confidence in Raffety et al.'s (1997) test research. However, differences for self-confidence frequency mirrored those observed between the debilitators and facilitators for the intensity dimension. Specifically, in addition to experiencing lower levels of self-confidence, the debilitators thought about self-confidence less often during the 7 days before competition.

Taken collectively, it appears that debilitators differ in their symptom responses (i.e., intensity, direction, and frequency) when compared to facilitators. Specifically, not only do the debilitators view their anxiety symptoms as negative toward performance, they also think about these symptoms more often in the time preceding competition. Further, they experience lower levels of self-confidence and think about these symptoms less often as competition moves closer.

A further theoretical aim of the study was to examine the temporal changes in intensity, direction, and frequency of symptoms as competition approached. No significant interactions were obtained suggesting the three interpretational groups responded to competitive stress with similar patterns over time. The findings for the intensity dimension indicated cognitive anxiety increased from 48 hr to 24 hr and 24 hr to 1 hr before competition. Although previous research has noted increases in cognitive intensity at times close to competition (e.g., Hanton et al., 2004; Swain & Jones, 1993), these results were not in line with the proposed hypothesis or Martens et al.'s (1990) MAT predictions. However, the small effect size value noted for the differences (.16) provides some support for the lack of expected change in cognitive

anxiety as competition approaches.

The patterns observed for somatic intensity tended to follow the predicted time-to-event changes showing an increase in levels on the day of competition (Martens et al., 1990), with a moderate effect size value supporting the influence of the independent variable (.41). However, one confounding result was an increase in somatic anxiety between 7 days and 48 hr precompetition. Although this pattern has been realized in previous intensity based temporal research (e.g., Swain & Jones, 1992), it has not normally been noted in the literature. Possible explanation could rest with group training times within the temporal phase. A number of performers, especially those derived from team sports, participated in training sessions 48 hr prior to competition. Despite the fact instructions for the CSAI-2 emphasized the response set of "how you feel right now" in relation to "upcoming competition," data collected at such times may have been influenced by the physical symptoms performers were experiencing from the training environment. The authors suggest future temporal researchers should avoid data sampling points associated with performers' training times or conduct research to examine the impact of such activities.

Patterns for self-confidence intensity contradicted the proposed hypothesis indicating levels decreased between 24 hr and 1 hr precompetition. However, the small effect size (.17) suggested that the independent variable had a small effect over temporal changes, supporting the theoretical proposals of Martens et al. (1990). Although slightly speculative, the role of symptom interpretation on self-confidence levels could be important when explaining the findings. As previously outlined, facilitators and debilitators experienced different levels of self-confidence throughout the precompetition period. In comparison to previous temporal research, the number of debilitators within the current sample was high, a factor which could have contributed to the lowering of self-confidence as competition approached, albeit an insufficient enough contribution to elicit a statistical interaction.

In contrast to the proposed hypothesis, time-to-competition changes were observed in the direction dimension for cognitive and somatic anxiety with small to moderate effect size values (.31 and .37, respectively). Specifically, interpretation of both constructs became more negative (or less positive) between 24 hr and 1 hr before competition. This finding conflicts with the work of Wiggins (1998), who suggested perceptions of anxiety did not vary as a function of time-to-competition. However, using a qualitative design, Hanton, Mellalieu, and Young (2002) recently established that performers' interpretation of symptoms can change as competition approaches. These authors noted that performers interpreted cognitive and somatic symptoms as facilitative during the preparation phase for competition but that these same symptoms were interpreted as debilitating directly before performance. The temporal patterns noted for direction in this study support this perspective, indicating that performers were possibly distinguishing between preparatory and performance anxiety (Burton, 1998).

Temporal patterns in the frequency dimension supported the proposed hypothesis with changes being observed in cognitive and somatic anxiety and stable patterns being displayed for self-confidence. Specifically, performers thought or experienced cognitive and somatic anxiety symptoms progressively more as competition approached with effects size values that indicated a small to large influence of the independent variable (.24 and .97, respectively). These increases in the frequency of anxiety-related symptoms support and extend Swain

and Jones' (1993) preliminary findings across a longer precompetition time period and corroborate with the test anxiety research of Raffety et al. (1997). In light of MAT predictions for cognitive anxiety intensities (i.e., that they remain unchanged in the precompetition period), the frequency data over time are of particular interest. The use of this dimension calls into question the stability of cognitive anxiety as competition moves closer, indicating the frequency dimension is more sensitive to symptom changes over time (Hanton et al., 2004). Indeed, this type of finding may go some way to explaining the equivocal results detailed earlier regarding the onset of cognitive anxiety intensity changes as the competition nears. It could be that individuals have been confusing these symptoms (i.e., intensity and frequency) leading to measurement inaccuracies and hence equivocal results through data derived from the intensity based CSAI-2. Conversely, the argument put forward by mainstream psychologists, and the conclusion that humans are more capable of encoding and thus accurately reporting frequency rather than intensity-based affect, implies greater notice should be accorded to the frequency results (Diener et al., 1991; Kardum, 1999).

At the applied level, the between-subject group effects have implications for intervention program structure for athletes with debilitating interpretations. Specifically, in order to counter the lower self-confidence intensity, more negative interpretation of cognitive and somatic anxiety, higher frequency of cognitive anxiety, and lower frequency of self-confidence debilitators should integrate psychological skills into their preparation for competition. Ideally, these programs should include skills such as thought stopping, cognitive restructuring and positive self-talk in line with the research of Hanton and Jones (1999b). Alternatively, sport psychologists could utilize educational methods and experiential learning early in the athlete's career to help prevent the symptoms from occurring at a later date in the athlete's competitive career. One limitation to these proposals is the lack of performance data within the present study. Essentially, in outlining these implications, we have made the assumption that facilitators perform better than debilitators. However, although performance data were not collected in this study, previous research has noted that elite versus nonelite athletes (Jones et al., 1994; Jones & Swain, 1992) and better versus poorer performers (Jones et al., 1993) possess more facilitative interpretations of cognitive and somatic anxiety. The within-subject time-to-competition changes for intensity, direction, and frequency suggest that athletes should integrate psychological skills from within 48 hr precompetition, with a high emphasis placed on the final 24 hr preceding the event. These proposals are based on the increases noted in cognitive and somatic anxiety intensity and frequency, the more negative interpretation of cognitive and somatic symptoms, and the decrease in intensity of self-confidence recorded between 24 hr and 1 hr precompetition. However, the earlier increases observed in frequency of cognitive and somatic anxiety suggests integration of psychological skill usage could occur earlier during the preparation time for competition.

The interesting between, and within-subject findings for frequency of symptoms suggests this under investigated dimension should be accorded more research attention. There is a need for this research to determine whether frequency assessments predict more performance variance than intensity or direction, or whether a combination of these assessments can explain most variance. Additionally, this study has observed that debilitators and facilitators experience different symptom intensities, directions, and frequencies through the time preceding

competition. However, this research design, nor the data produced, provide any foundation for why these differences occurred. Future research, possibly through qualitative methods, should examine the psychological approaches facilitators and debilitators take during the time leading up to competition. Further, related to change-over-time patterns, this research should examine the triggers which lead to increases in anxiety levels and frequencies and the onset of more negative symptom interpretations as competition approaches. Combinations of these research programs would be relevant to the applied practitioner regarding the structure and timing of intervention programs designed to optimize psychological preparation in the periods leading up to competition.

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