

An analysis of competitive state anxiety using the Competitive State Anxiety Inventory-2 (CSAI-2; Martens et al., 1990) at three pre-event time points.

Introduction

Competitive state anxiety is one of the most deeply examined factors in sports psychology because it is aligned to how athletes interpret and respond to the demands of competition. Early work within multidimensional anxiety theory (Martens, Vealey & Burton, 1990.) proposed that CSA comprises distinct but related components - cognitive anxiety, somatic anxiety and self-confidence - which differentially relate to performance. Cognitive anxiety reflects worry, negative expectations and disrupted concentration; whereas, somatic anxiety captures the arousal and tension associated with competition; self confidence represents the athlete's belief in their own ability to succeed. These three dimensions form the basis of the Competitive State Anxiety Inventory-2 (CSAI-2,) a 27-item self-report measure that remains one of the most widely used tools for assessing CSA in sport.

Research on the intensity and temporal patterning of CSA has highlighted that anxiety is not static but fluctuates as competition approaches. Jones and Swain's work in 1992 on intensity and direction suggested that athletes experience rising levels of both cognitive and somatic anxiety in the hours and minutes before performance, but that the *interpretation* of these symptoms (as facilitative or debilitative) is often more predictive of performance than intensity alone. Building on this, Chamberlain and Hale (2007) showed that, in a golf putting task, cognitive anxiety intensity was negatively related to performance, somatic anxiety displayed a curvilinear (inverted-U) relationship, and self-confidence was positively related to performance; importantly, directional perceptions of anxiety explained more variance in performance than intensity scores. These findings underline that both how much anxiety athletes feel and how they interpret it over time are central to understanding CSA.

The importance of CSA in sport is further evidenced by meta-analytic work examining its relationship with performance. Craft, Magyar, Becker, and Feltz (2003) reported generally weak but meaningful associations between CSAI-2 subscales and performance, with self-confidence showing the strongest and most consistent positive relationship. Such results support the view that anxiety is not uniformly harmful; rather, its impact depends on the balance between cognitive worry, somatic arousal, and confidence, as well as the timing of these responses relative to competition. From an applied perspective, understanding CSA allows coaches and practitioners to tailor psychological skills training, arousal regulation strategies, and confidence-building interventions to individual athletes.

The CSAI-2 operationalises CSA through three subscales: cognitive anxiety, somatic anxiety, and self-confidence, each derived from nine items rated on a four-point Likert scale. This multidimensional structure enables practitioners to identify whether an athlete's pre-competitive difficulties are primarily cognitive (e.g., worry and fear of failure), somatic

(e.g., muscle tension, “butterflies”), or related to low confidence, thereby informing targeted interventions. Because CSA is dynamic, it is typically measured in the run-up to an event—often at multiple time points (e.g., 48 hours, 1 hour, and immediately pre-performance)—to capture its temporal patterning. Studies using repeated CSAI-2 assessments have shown that somatic anxiety tends to peak closest to performance, whereas cognitive anxiety and self-confidence may stabilise earlier, reflecting athletes’ appraisals of their readiness and perceived control.

Measuring CSA in the build-up to competition therefore serves several purposes: it tracks how anxiety and confidence evolve as situational demands intensify; it helps identify athletes at risk of debilitating anxiety or “choking”; and it provides an evidence base for evaluating the effectiveness of psychological interventions over time. Collectively, the literature on intensity, temporal patterning, and multidimensional assessment underscores CSA as a critical construct for explaining and optimising competitive performance in sport.

Research question, aim and hypotheses:

Aim: The aim of this study is to examine how competitive state anxiety fluctuates across three pre-event time points, focusing on changes in somatic and cognitive anxiety and self-confidence as measured by the CSAI-2. The study seeks to identify temporal patterns in these psychological responses and explore whether anxiety intensity increases and confidence decreases as competition approaches.

How do cognitive anxiety, somatic anxiety and self-confidence levels differ across three pre-event time points in athletes preparing for competition?

Hypothesis: athletes will experience increasing cognitive anxiety and somatic anxiety and decreasing self-confidence as the competition approaches, with the most pronounced cognitive worry and physiological arousal occurring at the final pre-event time point, alongside the lowest levels of confidence.

Method

Twenty university athletes aged 18–25 years took part in this study, all of whom were active competitors in organised university sport. A repeated-measures design was used to assess changes in competitive state anxiety across three pre-event time points: one week before competition, 24 hours before, and the morning of the event. Competitive state anxiety was measured using the CSAI-2, a 27-item questionnaire assessing cognitive anxiety, somatic anxiety, and self-confidence on a four-point Likert scale. Participants provided informed consent and completed a short demographic form recording their age and whether they competed in team or individual sports, allowing exploration of whether sport type influenced

anxiety patterns. At each time point, athletes completed the CSAI-2 in a quiet environment and were instructed to respond based on how they felt “right now” about the upcoming event. The first administration occurred after training one week before competition, the second 24 hours before the event, and the final administration on the morning of competition before warmup. All responses were anonymised using participant codes. Following data collection, CSAI-2 subscale scores were entered into a results table, and a graph was produced to visually illustrate changes across time points, making patterns in cognitive and somatic anxiety easier to interpret during analysis.

Results

Figure 1: a graph to show the three dimensions 1 week prior to the sporting event

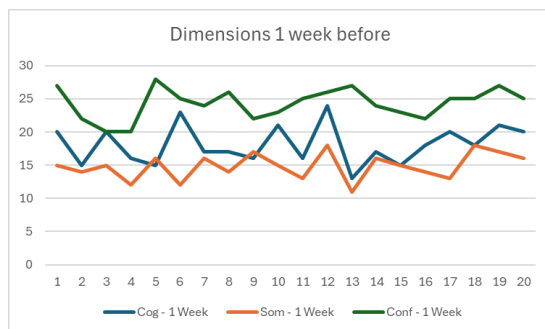


Figure 2: a graph to show the three dimensions 24 hours prior to the sporting event

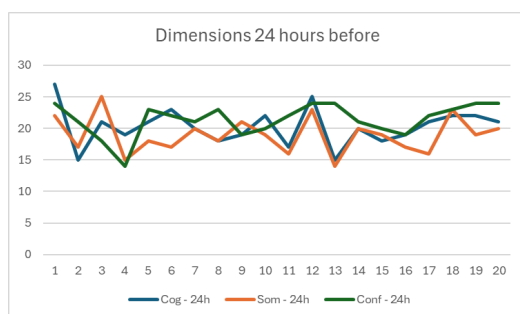
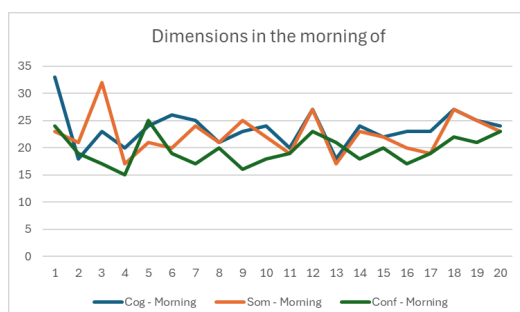


Figure 3: a graph to show the three dimensions the morning of the sporting event



Descriptive statistics were calculated for cognitive anxiety, somatic anxiety and self-confidence across the three pre-event time points to illustrate how competitive state anxiety changed as competition approached. Mean cognitive anxiety increased steadily from 17.8 one week before the event to 20.2 at 24 hours and 23.4 on the morning of competition, indicating a clear upward trend in pre-competitive worry. Somatic anxiety followed a similar pattern, rising from 14.9 at one week to 18.4 at 24 hours and 22.0 on the morning of the event, reflecting the expected intensification of physiological arousal as athletes neared performance. In contrast, self-confidence showed a gradual decline, decreasing from 24.4 at one week to 22.1 at 24 hours and 21.7 on the morning of competition. These patterns align with established temporal-patterning research, suggesting that both cognitive and somatic anxiety intensify closest to competition while confidence tends to diminish.

Table 1: Data showing the means of each dimension at three different time periods.

	Cog - 1 week	Som - 1 week	Conf - 1 week	Cog - 24 hours	Som - 24 hours	Conf - 24 hours	Cog - mornin g	Som - morning	Conf - morning
Mean	18.1	14.85	24.3	20.25	18.95	21.4	23.5	22.4	19.65

A results table was produced to summarise the means and standard deviations for each subscale at each time point, providing a clear numerical overview of the data. To support interpretation, a line graph was created to visually display changes across the three time points, enabling easier comparison of trajectories between cognitive anxiety, somatic anxiety and self-confidence. Demographic data (age and sport type: team vs individual) were also collected to allow exploration of whether these factors influenced anxiety responses.

Discussion and conclusion

The findings of this study demonstrate clear temporal changes in competitive state anxiety across the three pre-event time points, supporting much of the existing literature on intensity and temporal patterning. Cognitive and somatic anxiety increased progressively from one week before competition to the morning of the event, while self-confidence showed a gradual decline. These results align closely with the multidimensional anxiety theory proposed by Martens et al. (1990), which suggests that cognitive worry and physiological arousal intensify as athletes approach performance. Similarly, the upward trajectory of somatic anxiety mirrors the temporal patterning described by Jones (1995), who noted that physiological symptoms typically peak immediately before competition due to heightened anticipation and perceived pressure.

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The increase in cognitive anxiety may reflect athletes' growing awareness of the event's importance, uncertainty about performance outcomes, and increased evaluative concerns. As

competition nears, athletes often engage in more self-appraisal and outcome-focused thinking, which can elevate worry. The rise in somatic anxiety is likely linked to physiological arousal triggered by anticipation, adrenaline release, and pre-performance routines. The decline in self-confidence is consistent with research by Craft et al. (2003), who found that confidence can fluctuate depending on perceived readiness, recent training quality, and comparisons with opponents. Individual differences—such as experience level, coping skills, and whether athletes competed in team or individual sports, may also have contributed to variability in responses.

Overall, the findings support the hypothesis that cognitive and somatic anxiety would increase and self-confidence would decrease as competition approached. The research question—how CSAI-2 subscales differ across three pre-event time points—was clearly answered: all three psychological states changed systematically, with anxiety intensifying and confidence diminishing closest to performance.

These results have several practical implications. For athletes, understanding their own anxiety patterns can help them anticipate when symptoms are likely to peak and apply appropriate psychological strategies, such as breathing control, self-talk, or pre-performance routines. Coaches can use this information to tailor support, ensuring that training sessions, tactical briefings, and motivational interventions are timed to minimise unnecessary pressure. Monitoring CSA across multiple time points may also help identify athletes at risk of debilitating anxiety, enabling early intervention.

For researchers, the study reinforces the value of repeated-measures designs in capturing the dynamic nature of competitive anxiety. Future work could explore moderating variables such as sport type, gender, or competitive experience, as well as the role of anxiety direction (facilitative vs. debilitating), which has been shown to influence performance outcomes.

In conclusion, this study provides clear evidence that competitive state anxiety intensifies and self-confidence declines as competition approaches, supporting previous research and highlighting important implications for applied sport psychology and future investigation.

Word Count: 1650

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