Validation of the French version of the Competitive State Anxiety Inventory-2 Revised (CSAI-2R) including frequency and direction scales

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ABSTRACT

Objectives: The main purpose of the present study was to evaluate the validity and the reliability of the French version of the Competitive State Anxiety Inventory-2 Revised (CSAI-2R) including direction and frequency scales.

Method: Six hundred and forty two male and female athletes competing in different individual and team sports participated in the study. Data were analysed with reliability and confirmatory factor analyses as well as with correlational analyses.

Design: Cross-sectional with self-reported questionnaires.

Results: Confirmatory factor analyses showed acceptable fits of the data for the 3-factor models (somatic anxiety, cognitive anxiety and self-confidence) of the intensity, direction, and frequency scales, and a good fit of the data for the hypothesized 9-factor model (i.e., including the three scales). Results provided evidence for the relative superiority of a model of the French CSAI-2R in which the somatic anxiety item 1 was discarded. The pattern of inter-scale correlations between the different subscales was in line with the results reported by the literature and suggested not including the self-confidence direction subscale because it might measure the same concept as the self-confidence intensity subscale. The patterns of relationships between the Sport Anxiety Scale, the Sport-Multidimensional Perfectionism Scale (Sport-MPS) and the three scales of the CSAI-2R provided evidence for the criterion-related validity of the French CSAI-2R.

Conclusion: This study provided support for the reliability and validity of the French version of the CSAI-2R including direction and frequency scales. Competitive state anxiety is significantly associated with competitive trait anxiety and sport perfectionism.

In psychology, anxiety is one of the most frequently investigated variables and has a long history of theoretical and empirical attention (Cerin, Szabo, Hunt, & Williams, 2000; Jones, 1995). One of the early developments in anxiety research is the adoption of state-trait approach. Competitive trait anxiety directly affects the perception of threat, subsequently mediating the level of state anxiety experienced by athletes (Martens, Vealey, & Burton, 1990; Smith, Smoll, & Schutz, 1990). Competitive state anxiety is conceptualized as a situation-specific multidimensional construct comprising cognitive and somatic components (Martens et al., 1990; Smith, Smoll, Cumming, & Grossbard, 2006). One of the most widely used scales for measuring competitive state anxiety is the Competitive State Anxiety Inventory-2 (CSAI-2; Martens et al., 1990). Since the introduction of the CSAI-2, which measures self-confidence in addition to cognitive and somatic anxiety, research has examined patterns and antecedents of competitive state anxiety among athletes of different sports and abilities, in addition to focusing on the relationship between anxiety and performance (Cerin et al., 2000; Jones, 1995; Woodman & Hardy, 2001).

Limitations have been raised about the trustworthiness of the data obtained with this scale (Cox, Martens, & Russell, 2003; Lundqvist & Hassmén, 2005). Criticism has been based on shortcomings in the original validation studies conducted by Martens et al. (1990): (1) the self-confidence scale was included as a result of the statistical analysis and not as a result of the theoretical framework, (2) the sample sizes were relatively small (i.e., 80 to 162 cases), and (3) responses from the same data were sometimes analysed instead of performing cross-validation to new samples (Cox et al., 2003). The exclusive use of exploratory factor analysis

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has also been questioned because it seemed that there was sufficient theoretical basis for specifying the model to be tested before the analysis (Cox et al., 2003). Studies using confirmatory factor analysis have failed to find adequate goodness-of-fit for the original factorial structure suggested in the original version of the CSAI-2 (Cox et al., 2003; Lundqvist & Hassmén, 2005). The construct validity of the CSAI-2 has also been questioned. In particular, the use of the word "concerned" in eight items measuring cognitive anxiety has been argued to be interpreted both negatively and positively by athletes (Woodman & Hardy, 2001). The French version of the CSAI-2 uses the term worried and not the term concerned (Cury, Sarrazin, Pérès, & Famose, 1999). Recently, using the Lagrange multiplier test, Cox et al. (2003) revised the original model through sequential item deletion. All parameters above 10 were stepwise removed. The final model (17 items) excluded 2 somatic items, 4 cognitive items and 4 self-confidence items. Research displayed an adequate model fit suggesting that the Competitive State Anxiety Inventory-2 Revised (CSAI-2R) is a more psychometrically sound instrument than the original CSAI-2 (Cox et al., 2003; Lundqvist & Hassmén, 2005).

Jones (1995) suggested that measuring an individual's anxiety levels (intensity) alone is limited. Two performers experiencing identical symptoms of anxiety prior to competition might label those symptoms as debilitative (i.e., performer is worried) or facilitative (i.e., performer viewed such a state as necessary since it signals the importance of the event) in regards to their performances (Jones, 1995). Although the intensity of the anxiety symptoms may not change, a state in which worries (i.e., intensity) are occurring 5% of the time is different from one in which they are occurring 90% of the time (Jones, 1995). Thus, additional dimensions of competitive state anxiety have been proposed such as direction, defined as the interpretation of the symptoms associated with competitive anxiety as being facilitative or debilitative towards performance (Jones & Hanton, 2001), and frequency, defined as the amount of time spent attending to symptoms experienced concerning competition (Swain & Jones, 1993). Jones and Swain (1992) and Swain and Jones (1993) modified the CSAI-2 by adding respectively a direction and a frequency scale. Despite these additional scales have been used extensively by researchers, no study has tested their validity. Only internal reliability has been reported to be satisfactory (Cronbach's alpha coefficients >.70) for the direction (Jones & Hanton, 2001; Thomas, Maynard, & Hanton, 2004) and frequency scales (Thomas et al., 2004).

The acquisition of knowledge is dependent on reliable and valid instruments. The development of an inventory for measuring state anxiety is an important step to study the concept of competitive anxiety. Although a modified version of the CSAI-2 (i.e., CSAI-2R, Cox et al., 2003) and additional scales (i.e., direction and frequency) have been proposed in the sport psychology literature (Jones & Hanton, 2001; Jones & Swain, 1992; Swain & Jones, 1993; Thomas et al., 2004), they require further evaluation in independently drawn samples. The purposes of the present study were to evaluate the validity and reliability of the three scales (i.e., intensity, direction and frequency) of the French version of the Competitive State Anxiety Inventory-2 Revised (CSAI-2R) and to assess criterion-related validity of the French CSAI-2R.

Stage 1: Factorial validity and reliability evidences of the French CSAI-2R

Method

Participants

A total of 642 male and female athletes ranging in age from 13 to 25 years participate in the study. Two samples were employed. Sample 1 included 191 athletes (91 female and 100 male) aged between 18 and 25 years old ($M = 20.97$, $SD = 2.79$) competing at the regional level.[2] Athletes were drawn from sports of athletics ($n = 15$), basketball ($n = 22$), soccer ($n = 54$), gymnastics ($n = 12$), handball ($n = 29$), judo ($n = 16$), rugby ($n = 26$) and table tennis ($n = 17$). They had an average of training of 7 h per week. They have played in 15 or more competitions during the season. Sample 2 consisted of 461 players (213 female and 248 male) of French handball school aged of 13–18 year ($M = 15, 68$; $SD = 1, 17$) competing at the national level. They had an average of training of 12 h per week. They have played in 20 or more competitions during the season.

Translation of the Competitive State Anxiety Inventory-2 Revised (CSAI-2R)

The original CSAI-2R (Cox et al., 2003) including scales for direction (Jones & Swain, 1992) and frequency (Swain & Jones, 1993) consists of 17 items that assess cognitive anxiety (e.g., "I'm concerned that others will be disappointed with my performance"), somatic anxiety (e.g., "I feel tense in my stomach") and self-confidence (e.g., "I'm confident I can meet the challenge") with 5, 7 and 5 items respectively. Translation of the CSAI-2R into French was conducted according to a standardised back-translation procedure. The original CSAI-2R was first translated into French and sent to two bilingual translators who then translated it back into English. Subsequently, differences were discussed and solved so that the original meaning of each original item was considered to be present in the final French version (CSAI-2R French items were similar to those used by Cury et al., 1999).

The response scale had participants rate the intensity of each symptom on a scale of 1 (not at all) to 4 (very much so) (Cox et al., 2003). For the direction scale, the participant rated on a scale from −3 to +3 the degree to which the experienced intensity of each symptom was either debilitative or facilitative to subsequent performance with 0 indicating an 'unimportant' interpretation (Jones & Swain, 1992). A positive score represents a state of facilitation, and a negative one debilitation (Jones & Swain, 1992). Finally, the frequency scale assesses the degree to which symptoms related to thoughts or experiences occurred on a scale ranging from 1 (not at all) to 7 (all the time) (Swain & Jones, 1993).

Procedure

Following ethics approval from the institutional research ethics board, the coaches of each team/athlete were contacted to obtain permission to approach their athletes and ask them to participate in the study. Athletes' participation was voluntary, athletes' anonymity was ensured, and parental consent was requested for athletes of less than 18 years old. Because precompetitive anxiety is more likely to occur in important competitive settings (Martens et al., 1990), participants were asked to select an important competition of their season.

Participants of the sample 1 completed the CSAI-2R, including scales for direction and frequency, within two days after the completion of this competition. Coaches did not accept that their athletes complete an anxiety self-report before the competition because they appraised that this could interfere with athletes'

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[2] A portion of the data provided by a sub-sample of the sample 1 used in this study ($n = 166$) is also included in a paper by Martinent and Ferrand (2007). However, none of the factor analytic or correlational results pertaining to the data in this study ($n = 191$) are presented by Martinent and Ferrand (2007). As such, there is no duplication of results.