Normative and idiosyncratic measures of positive and negative affect in sport

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Received 7 July 1999; received in revised form 15 February 2000; accepted 20 March 2000

Abstract

Objectives: The purposes of the study were to: (a) ascertain the degree of similarity amongst normative and idiosyncratic measures of affect; (b) test the notion of reversal effects on the functional impact and the hedonic tone of emotions; (c) analyse the differences on the intensity of facilitating-positive, facilitating-negative, inhibiting-positive, and inhibiting-negative performance emotion content categories, and (d) test whether competitive trait anxiety intensity could predict pre-performance normative or idiosyncratic negative affect intensity.

Design: A cross-sectional study design was employed using normative and idiosyncratic measures of affect.

Methods: Experienced male soccer and volleyball players (N = 124) were individually assessed. Normative scales were the Positive and Negative Affect Schedule (PANAS) used as a sport-specific trait measure of competitive affect, and the Sport Anxiety Scale (SAS) administered for the assessment of competitive trait anxiety. Idiosyncratic affect occurring prior to or during optimal and poor competitions was identified in the conceptual framework of the Hanin’s Individual Zones of Optimal Functioning (IZOF) model (Hanin, Y.L. (1997). Emotions and athletic performance: Individual zones of optimal functioning model. European Yearbook of Sport Psychology, 1, 29–72).

Results: Findings revealed low overlap amongst the PANAS items and the idiosyncratic items, reversal effects on the functional impact and the hedonic tone of emotions, higher level of positive affect associated with optimal performance when compared with all other affect categories, and lower levels of facilitating-negative category when compared with the facilitating-positive. Moreover, sport trait anxiety intensity was found to predict negative affect intensity as assessed by the PANAS normative scales and by the idiosyncratic items. For idiosyncratic affect, however, significant differences emerged only when comparing individuals with very high or very low anxiety symptoms.
Conclusions: Idiosyncratic affect scales together with normative scales are recommended for research and applied purposes. The functional impact as well as the hedonic tone of emotion items need to be examined according to individual perception. © 2000 Elsevier Science Ltd. All rights reserved.

Keywords: Positive affect; Negative affect; Anxiety; Normative measures; Idiosyncratic measures

The effects of emotions upon sport performance and the athlete have recently attracted the attention of researchers and practitioners. Though results remain far from conclusive, advancements have been made in the study of performance-related emotions in relation to whether they are facilitating or inhibiting and positive or negative (see Hanin, 1997; Robazza, Bortoli, & Nougier, 1998a). A great deal of earlier research reported in the sport psychology literature was mainly concerned with the debilitating consequences of anxiety or other negative emotions. Many investigators have employed multidimensional anxiety scales such as the Competitive State Anxiety Inventory-2 (CSAI-2; Martens, Burton, Vealey, Bump, & Smith, 1990) and the Sport Anxiety Scale (SAS; Smith, Smoll, & Schutz, 1990), or adopted affective measures such as the Profile of Mood States (POMS; McNair, Lorr, & Droppleman, 1971; Rowley, Landers, Kyllo, & Etnier, 1995), in the framework of group-oriented (nomothetic) approaches, with the same self-report normative scales administered to different athletes. The emphasis placed on anxiety or negative emotions inhibiting performance as well as the use of normative measures was criticised by several researchers. They contended that (a) the limited number of emotions usually assessed by the questionnaires may not tap adequately the individual competitive experience (Hanin & Syrjä, 1995a), (b) data about groups obtained from normative scales are not always individually relevant (Krane, 1993; Raglin, 1992), and (c) the use of affective measures not developed for sporting or physical activity contexts raises concerns of construct validity (Gauvin & Rejeski, 1993; McAuley & Courneya, 1994).

Mixed nomothetic-idiographic approaches, recommended by some authors to overcome the limitations of normative measures (e.g., Dunn, 1994; Strean & Roberts, 1992), have been employed in monitoring of emotions as well as other preperformance psychological variables. For example, anxiety subcomponents (tension, worry, and self-confidence) and idiosyncratic emotions were repeatedly assessed in track and field athletes over a whole competitive season (Robazza, Bortoli, Zadro, & Nougier, 1998b), and in top level archers across the World Championships (Robazza, Bortoli, & Nougier, in press). The mixed approach was shown to be beneficial in contrasting good and poor performances, in comparing successful and less successful athletes, and in gaining relevant information on the individual.

A direct comparison amongst normative and individualised scales was conducted by Syrjä and Hanin (1997) with Finnish male Olympic level soccer players in the framework of Hanin’s Individual Zones of Optimal Functioning (IZOF) model (see Hanin, 1997, for a review). The normative items were those of the State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, & Lushene, 1970), the Profile of Mood States (POMS; McNair et al., 1971), and the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). Individualised positive and negative affect scales consisted of athlete-generated items identified by asking the performer to reflect upon past optimal and poor performances and to recall related feelings. As expected, low similarity amongst normative and idiosyncratic items was found. These findings are consistent with other
research showing that optimal and non-optimal positive and negative affect patterns are individual within and across different sports (Hanin & Syrjä, 1995a, 1995b; Robazza et al., 1998a, 1998b, in press). Although the conclusion that normative scales are inadequate in the assessment of athletic emotional experience sounds plausible, investigation in this area is rather scant and replication studies are needed. Thus, a goal of this study was to establish the degree of similarity amongst the PANAS and the idiosyncratic affect scales in computing the amount of item overlap for the two measures. According to previous research findings, low overlap was expected.

The functional impact and the hedonic tone of performance emotions was the main topic of a study intended to verify the notion of reversal effects (Robazza et al., 1998a). Specifically, in the development of affect idiographic profiles, both positive and negative emotions are assumed to exert beneficial or detrimental effects on the task at hand, depending on the individual. Therefore, in the emotional profiling procedure the athlete is encouraged to identify positive and negative emotions facilitating or inhibiting performance. A reversal effect in the functional impact is found when negative emotions are individually experienced as advantageous and, conversely, when positive emotions are perceived as harmful. Results have confirmed this reversal effect in the functional impact of emotions on performance (e.g. Hanin & Syrjä, 1995a,b). On the other hand, a reversal effect in hedonic tone is expected when conventionally labeled negative affect (Watson & Tellegen, 1985) is individually perceived as positive or, vice versa, when positive affect is perceived as negative. Research findings have also confirmed the reversal effect in hedonic tone (Robazza et al., 1998a). In addition, preliminary results indicate that negative emotions are generally perceived as facilitating when low in intensity. In summary, athletes seem to perceive emotions as facilitating or debilitating, and positive or negative depending on idiosyncratic meaning and intensity. These tentative conclusions, although appearing fairly robust, deserve further testing. Consequently, additional objectives of this study were to test the notion of reversal effects on both the functional impact and the hedonic tone of idiosyncratic emotions, and to analyse the differences on the intensity of the four performance-emotion content categories (facilitating-positive, facilitating-negative, inhibiting-positive, inhibiting-negative).

A final goal of the study was to investigate the relationship of intensity of sport-specific cognitive and somatic trait anxiety with the four affect content categories. Smith et al. (1990) developed the Sport Anxiety Scale (SAS) to measure individual differences in cognitive and somatic anxiety. Athletes high in trait anxiety assessed by the SAS are expected to experience high levels of worry, concentration disruption, and somatic arousal when exposed to the stressful conditions of sport competition. Smith et al. (1990) administered the SAS to football players two weeks before the season and then measured the athletes’ mood states three hours before a game using a short form of the POMS. Somatic anxiety and worry scores of the SAS correlated highly with tension and confusion scores from the POMS; correlations with anger were lower, while those with vigour were not significant. Thus, the SAS scales appeared to be related to negative mood but not to positive mood. These preliminary results led the authors of the scale to recommend further examination of the discriminant validity of the SAS in relation to affective responses other than anxiety. To address this issue, the SAS scores were used in the present study to predict preperformance normative and idiosyncratic affect content categories. The enduring predisposition to perceive high levels of competitive anxiety, measured by the SAS, were hypothesised to be related to high intensity of negative affect, especially under failure. Hence, individuals high in sport-specific trait anxiety were expected to experience higher intensity of negative affect associated with poor performance when compared to those low in anxiety.
In short, the four purposes of this study were to: (1) establish the amount of overlap amongst the PANAS items and the idiosyncratic items. Low overlap was expected; (2) support the notion of reversal effects on both the functional impact and the hedonic tone of emotions; (3) analyse the intensity differences on the four performance-emotion content categories. Lower intensity was predicted in the facilitating-negative category compared to the facilitating-positive category; and (4) verify whether competitive trait anxiety intensity predicted preperformance normative or idiosyncratic negative affect intensity. In particular, trait anxiety was expected to be related to poor performance negative affect.

Method

Participants

The participants (N = 124) were experienced Italian male soccer (n = 63; mean age = 24.31; SD = 2.54; from 4 clubs) and volleyball players (n = 61; mean age = 25.63; SD = 2.38; from 6 clubs) drawn from semi-professional clubs in the north-east of Italy. Players’ sport experience ranged from 6 to 20 years (M = 12.39, SD = 3.76) and they took part in regular local and regional championships at third division level. During a 7-month competitive season, players were involved in a weekly game of third division. Practice sessions took place four times a week and lasted about two hours each. Soccer and volleyball were chosen for investigation because the two sports are very popular in the northern part of Italy. These sports are mainly played by males. Access was gained at the practice sites explaining the goal of research to sport managers and coaches and then to players.

Measures

Positive and negative affect schedule (PANAS)

The PANAS (Watson et al., 1988) consists of two 10-item scales, one to assess positive affect (PA) and the other to assess negative affect (NA). The PA scale includes terms such as “enthusiastic,” “determined,” and “active,” while the NA scale contains terms such as “afraid,” “distressed,” and “hostile.” Items are scored on a 5-point scale ranging from 1 (“very slightly/not at all”) to 5 (“extremely”). Therefore, possible scores on each scale range from 10 to 50. Watson et al. (1988) reported adequate internal consistency on both scales (α > 0.84), and factorial as well as external validity for adult community samples. The PANAS has been utilised in physical activity studies (e.g. Crocker, 1997; Crocker & Graham, 1995) and findings provided psychometric support for the instrument.

The scales can be used as state or trait measures of affect by adopting different instructions. In the present study, the PANAS was used as a sport-specific trait measure of competitive affect requiring participants to indicate to what extent they generally experience each emotion, thinking first to optimal and then to poor performance. With this procedure, four assessments are obtained: PA and NA associated with optimal performance, and PA and NA associated with poor performance. The Italian version of the PANAS was developed by having two psychologists translating
items into Italian and two translating back into English. Help from a native English speaker was also sought to ensure translation accuracy and meaning.

Internal consistency of the PANAS scales was satisfactory; higher values for recalled poor performance (PA scale $\alpha = 0.83$, NA scale $\alpha = 0.84$) compared to recalled optimal performance (PA scale $\alpha = 0.79$, NA scale $\alpha = 0.73$) were found. Scale correlations were low ($rs = -0.06$ and $-0.21$ for recalled optimal and poor performances, respectively), confirming the independence of the affect dimensions.

**Sport anxiety scale (SAS)**

The SAS (Smith et al., 1990) was developed as a sport-specific multidimensional competitive trait anxiety inventory and it is composed of three scales. The Worry Scale, consisting of seven items, includes “I’m concerned about performing poorly,” the 5-item Concentration Disruption Scale comprises “My mind wanders during sport competition,” and the Somatic Anxiety Scale, nine items, includes “My body feels tight.” The 21 items of the three scales were rated on 4-point scales ranging from 1 ("not at all") to 4 ("very much so"). Thus, scores can range from 7 to 28 on the Worry Scale, from 5 to 20 on the Concentration Disruption Scale, and from 9 to 36 on the Somatic Anxiety Scale. Smith et al. (1990) reported moderate to high correlations among the scales ($rs$ from 0.50 to 0.63), 7-day test–retest correlations exceeding 0.85 on all scales, and Cronbach alpha coefficients ranging from 0.74 to 0.88.

The Italian version of the SAS has been used in previous research (Robazza et al., 1998a). Four Italian English speaking sport psychologists translated the inventory. Two of them translated the SAS into Italian and the other two translated back into English. Accuracy and meaning of the translations were also examined with the assistance of a native English speaker. The reported Cronbach alphas were 0.85 for Worry, 0.66 for Concentration Disruption, and 0.84 for Somatic Anxiety. In this study, Cronbach alpha coefficients for the SAS scales were satisfactory, being 0.75 for somatic anxiety, 0.77 for worry, and 0.70 for concentration disruption. A low correlation was found between somatic anxiety and concentration disruption ($r = 0.13$), while moderate correlations emerged between somatic anxiety and worry ($r = 0.39$), and between worry and concentration disruption ($r = 0.47$).

**Idiographic scaling**

A stimulus list of 70 positive and negative affect items was used for participants to generate or identify idiosyncratic adjectives best representing personal competitive experience associated with their recalled optimal and poor performances. Emotions were derived by translating positive and negative items used by Hanin and Syrjä (1995a, 1995b) in their studies with athletic samples. The affect list also comprised all of the PANAS items. The Hanin and Syrjä’s procedure was modified in that one list of randomly arranged positive and negative items was used instead of two lists with separated positive and negative items. This way, the participant may not only identify descriptors of best or worst performances (as in the procedure advocated by Hanin & Syrjä), but also classify descriptors as pleasant or unpleasant. This methodology was successfully employed by Robazza et al. (1998a) to identify emotion reversal effects of functional impact and of hedonic tone: “focused,” “motivated,” and “determined” were among the most identified facilitating-positive items, whereas “tense,” “worried,” and “aggressive” were among the most identified facilitating-negative items. On the other hand, “unfocused,” “nervous,” and “unconfi-
dent” were often identified as inhibiting-negative items, whereas “relaxed,” “cheerful,” and “secure,” were selected as inhibiting-positive items.

Following identification of affect terms, each item was rated in intensity on Borg’s Category Ratio scale (CR-10). The CR-10 scale, developed to avoid a ceiling effect, has been used in psychophysical studies of exercise capacity, exertion, or pain (see Neely, Ljunggren, Sylvén, & Borg, 1992) and for investigations of emotions (Hanin & Syrjä, 1995a, 1995b). The verbal anchors of the scale were: 0 = nothing at all, 0.5 = very, very little, 1 = very little, 2 = little, 3 = somewhat, 4 = moderately, 5 = much, 7 = very much, 10 = very, very much, 11 = maximal possible (no verbal anchors were used for 6, 8, and 9). Single item scores may range from 0 to 11. Research findings have shown that skilled soccer players were accurate in the one-day predictions of pre-game affect as well as in the immediate post-performance recall of pre-game affect (Hanin & Syrjä, 1996). The individualised affect scales were reliable with mean intra-individual alphas ranging from 0.76 for debilitating positive or negative items to 0.90 for facilitating positive or negative items.

Procedure

Soccer and volleyball players were individually assessed. Each performer was given information about the purpose of the research, provided with clear instructions, and assured confidentiality regarding individual responses and identity. Informed consent was then obtained.

The athletes were required to complete the SAS using the instruction “How you usually feel prior to or during competition”. The PANAS terms were rated giving first the instruction “How you usually feel prior to or during best competitions”, and then rated once more with the instruction “How you usually feel prior to or during worst competitions”.

The idiographic scaling was conducted having performers choose up to three positive and three negative emotions associated with optimal performance, and three positive and three negative emotions associated with poor performance. Therefore, up to 12 emotions could be identified in the four emotion categories originated by the interaction of the functional dimension (i.e. the facilitating or inhibiting effects of emotions upon performance) with the hedonic tone dimension (i.e. the positive or negative affective experience). For this purpose, the same directions used for the PANAS were adopted. Athletes were encouraged to generate new appropriate items when those listed were deemed nonrepresentative of personal athletic experience. Intensity of facilitating positive and negative items was then rated on the CR-10 scale thinking about best competitions, whereas intensity of inhibiting positive and negative items was rated recalling worst competitions.

Results

Idiosyncratic affect and PANAS

Similarity of emotion content among the PANAS items and idiosyncratic items was established by computing the amount of overlap (i.e. shared items) using the formula proposed by Hanin and Syrjä (1997) and Syrjä and Hanin (1997): overlap \((ij) = nc(ij) / \sqrt{n(i) \times n(j)}\), where \(nc(i, j) =\) number of shared items for condition \(i\) and \(j\), \(n(i) =\) number of emotion words for condition
Table 1
Overlap values among idiosyncratic items and PANAS items

<table>
<thead>
<tr>
<th>Idiosyncratic items</th>
<th>PANAS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive affect</td>
</tr>
<tr>
<td>Facilitating-positive</td>
<td>0.26</td>
</tr>
<tr>
<td>Inhibiting-positive</td>
<td>0.26</td>
</tr>
<tr>
<td>Total facilitating and inhibiting-positive</td>
<td>0.26</td>
</tr>
<tr>
<td>Facilitating-negative</td>
<td>0.15</td>
</tr>
<tr>
<td>Inhibiting-negative</td>
<td>0.04</td>
</tr>
<tr>
<td>Total facilitating and inhibiting-negative</td>
<td>0.15</td>
</tr>
<tr>
<td>Total facilitating and inhibiting, positive and negative</td>
<td>0.26</td>
</tr>
</tbody>
</table>

\[i, n (j) = \text{number of emotion words for condition } j. \text{ Individual overlap scores may vary in range from } 0 \text{ (all items are different) to } 1.0 \text{ (all items are the same).}

Table 1 reports the overlap values of each of the idiosyncratic emotion content categories with the PANAS scales. As expected, the overlap was somewhat low at the group level since most of the items (60%) identified by athletes were not included in the PANAS. An even more pronounced item dissimilarity appeared when contrasting idiosyncratic with normative measures at the intraindividual level as more than 80% of the items identified by the individual were not in the PANAS (see Table 2 containing means and standard deviations of intraindividual affect content overlap). These findings were further confirmed by the very low correlation coefficients calculated among idiosyncratic affect and the PANAS subscales (see Table 3). Idiosyncratic affect and the PANAS seemed to measure different factors since they were largely uncorrelated.

**Idiosyncratic affect reversals**

The whole sample identified 70 items: 33 facilitating-positive, 46 facilitating-negative, 49 inhibiting-positive, and 45 inhibiting-negative. Eleven items were included in one content cate-

Table 2
Means and standard deviations of intraindividual overlap values among idiosyncratic items and PANAS items

<table>
<thead>
<tr>
<th>Idiosyncratic items</th>
<th>PANAS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive Affect</td>
</tr>
<tr>
<td>Facilitating-positive</td>
<td>0.14 (0.13)</td>
</tr>
<tr>
<td>Inhibiting-positive</td>
<td>0.09 (0.13)</td>
</tr>
<tr>
<td>Total facilitating and inhibiting-positive</td>
<td>0.13 (0.13)</td>
</tr>
<tr>
<td>Facilitating-negative</td>
<td>0.02 (0.06)</td>
</tr>
<tr>
<td>Inhibiting-negative</td>
<td>0.00 (0.02)</td>
</tr>
<tr>
<td>Total facilitating and inhibiting-negative</td>
<td>0.01 (0.04)</td>
</tr>
<tr>
<td>Total facilitating and inhibiting, positive and negative</td>
<td>0.06 (0.06)</td>
</tr>
</tbody>
</table>
Table 3
Correlations among idiosyncratic and normative scales

<table>
<thead>
<tr>
<th>Idiosyncratic and normative scales</th>
<th>Idiosyncratic items</th>
<th>SAS scales</th>
<th>PANAS scales</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FP</td>
<td>FN</td>
<td>IP</td>
</tr>
<tr>
<td>Idiosyncratic items</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Facilitating-positive (FP)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Facilitating-negative (FN)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inhibiting-positive (IP)</td>
<td>0.28**</td>
<td>0.29**</td>
<td></td>
</tr>
<tr>
<td>Inhibiting-negative (IN)</td>
<td>0.39**</td>
<td>0.46**</td>
<td>0.56**</td>
</tr>
<tr>
<td>SAS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Somatic anxiety (SA)</td>
<td>0.08</td>
<td>0.15</td>
<td>0.00</td>
</tr>
<tr>
<td>Worry (W)</td>
<td>-0.09</td>
<td>0.13</td>
<td>-0.01</td>
</tr>
<tr>
<td>Concentration disruption (CD)</td>
<td>0.04</td>
<td>0.08</td>
<td>0.01</td>
</tr>
<tr>
<td>PANAS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Facilitating-positive (FP)</td>
<td>0.18</td>
<td>0.08</td>
<td>-0.06</td>
</tr>
<tr>
<td>Facilitating-negative (FN)</td>
<td>-0.06</td>
<td>0.10</td>
<td>-0.00</td>
</tr>
<tr>
<td>Inhibiting-positive (IP)</td>
<td>0.21*</td>
<td>0.06</td>
<td>-0.02</td>
</tr>
<tr>
<td>Inhibiting-negative (IN)</td>
<td>0.06</td>
<td>0.06</td>
<td>0.03</td>
</tr>
</tbody>
</table>

* * p < 0.05, ** p < 0.01.
category, 24 items in two categories, 26 items in three categories, and 9 items in all categories. Motivated, focused, secure, determined, energetic, and confident were among the most selected facilitating-positive items, whereas enraged, tense, nervous, aggressive, and angry were among the most identified facilitating-negative items. Tired, relaxed, tranquil, calm, excited, and happy were the most selected inhibiting-positive items, whereas nervous, insecure, uncertain, and unconfident were the most identified inhibiting-negative items. Relaxed, tense, secure, calm, aggressive, excited, serene, satisfied, rested were the items identified in all content categories, thus revealing reversal effects in both the functional impact and the hedonic tone.

A reversal effect in the functional impact of emotions was apparent because 55 (78.57%) of the items, whether positive or negative, were both facilitating and inhibiting as different athletes perceived them to be associated with optimal or poor performances. Examples of those items are happy, focused, insecure, and nervous. Five (7.14%) items were perceived only as facilitating and 10 (14.29%) only as inhibiting. A reversal effect was also shown in the hedonic tone of emotions since 39 (55.71%) of the items, whether facilitating or inhibiting, were both positive and negative as different performers experienced them as pleasant or unpleasant. Examples of those items are energetic, proud, enraged, and worried. Sixteen (22.86%) items were experienced as only positive and 15 (21.43%) only negative.

Idiosyncratic affect intensity

Individual’s emotion intensity ratings for each of the four content categories were averaged for analyses, resulting in four scores for each participant. Two soccer players and three volleyball players did not identify emotions in one category of facilitating-negative or inhibiting-positive affect and, therefore, were excluded from the analysis of variance. Multivariate analysis of variance (MANOVA) was performed to ascertain whether the intensity of the four content categories of idiosyncratic affect differed in the two sports. Analysis did not yield a significant difference [Wilks’ $\lambda$ =0.97, $F(4,114) =0.82, p >0.05]$. Hence, players of the two sports did not differ in the intensity of facilitating-inhibiting and positive-negative affect categories. However, significant results emerged contrasting the four emotion content categories using a within-subjects ANOVA [$F(3,354) =39.90, p <0.0001]$. The Scheffé post-hoc test showed differences among all categor-

Normative affect

A MANOVA was conducted using the PANAS scales as dependent variables to determine whether the intensity of the four content categories of normative affect differed between the two sports. Analysis did not yield significant differences [Wilks’ $\lambda$ =0.95, $F(4,119) =1.26, p >0.05]$. The same analysis was employed using the SAS scales as dependent variables and, once again, no significant results were revealed [Wilks’ $\lambda$ =0.99, $F(3,120) =0.61, p >0.05]$. Therefore, players of the two sports did not differ in the intensity of affect as measured by PANAS or SAS scales. Yet, significant results emerged contrasting the PANAS scales using a within-subjects ANOVA [$F(3,369) =285.69, p <0.0001]$. The Scheffé post-hoc test showed differences among all categor-
ies: higher values were shown for PA associated with optimal performance ($M = 3.65, SD = 0.63$) and for NA associated with poor performance ($M = 2.74, SD = 0.82$) when compared to PA associated with poor performance ($M = 1.92, SD = 0.68$) and to NA associated with optimal performance ($M = 1.52, SD = 0.43$).

**Competitive trait-anxiety intensity as a predictor of affect intensity**

The raw SAS scores for each scale (worry, concentration disruption, somatic anxiety) were separately dichotomised into high and low categories using the median split technique. Participants were therefore categorised taking into account the level of their competitive trait anxiety for each anxiety subcomponent. Three separate one-way MANOVAs were performed using the SAS measures to ascertain the effects of the anxiety levels on the intensity of normative affect. The same analysis was conducted on the intensity of idiosyncratic affect. Hence, worry, somatic anxiety, and concentration disruption were entered as independent variables in the analysis, whereas intensity scores of the four normative or idiosyncratic affect content categories were used as dependent variables. The interactive effects of the anxiety subcomponents were not tested because of the relatively small number of participants resulting from the median split.

Analyses yielded significant results for worry [Wilks’ $\lambda = 0.91$, $F (4,119) = 2.95$, $p < 0.03$], concentration disruption [Wilks’ $\lambda = 0.92$, $F (4,119) = 2.61$, $p < 0.04$], and somatic anxiety [Wilks’ $\lambda = 0.87$, $F (4,119) = 4.61$, $p < 0.002$], when PANAS scores were analyzed. Follow-up univariate analyses showed that individuals high in anxiety tended to experience higher levels of negative affect associated with poor performance than those low in anxiety (high worry, $M = 2.95$, SD = 0.80, low worry, $M = 2.49$, SD = 0.77; high concentration disruption, $M = 2.92$, SD = 0.85, low concentration disruption, $M = 2.55$, SD = 0.75; high somatic anxiety, $M = 2.98$, SD = 0.77, low somatic anxiety, $M = 2.49$, SD = 0.79). As expected, higher correlation coefficients were found among anxiety scales and PANAS negative affect associated with poor performance (see Table 3).

When idiosyncratic affect scores were analysed, significant results did not emerge [worry: Wilks’ $\lambda = 0.97$, $F (4,114) = 0.78$, $p > 0.05$; concentration disruption: Wilks’ $\lambda = 0.99$, $F (4,114) = 0.16$, $p > 0.05$; somatic anxiety: Wilks’ $\lambda = 0.98$, $F (4,114) = 0.48$, $p > 0.05$]. Participants were further dichotomized into very high or very low categories of anxiety provided their anxiety-subcomponent scores were comprised in the fourth or first quartile, respectively. Since the number of participants included in the quartiles of each anxiety subcomponent was somewhat low (ranging from 27 to 43), three one-way MANOVAs were again performed employing each of the SAS scales separately as dependent variables. Once more, analysis did not yield significant differences [worry: Wilks’ $\lambda = 0.88$, $F (4,51) = 1.79$, $p > 0.05$; concentration disruption: Wilks’ $\lambda = 0.99$, $F (4,73) = 0.13$, $p > 0.05$; somatic anxiety: Wilks’ $\lambda = 0.89$, $F (4,52) = 1.55$, $p > 0.05$]. Significant results emerged when individuals in the ninetieth percentile (very high anxiety) were contrasted with scores of participants inside the tenth percentile (very low anxiety) using SAS total scores [$F (1,21) = 7.43$, $p < 0.02$]. Participants high in anxiety experienced higher levels of negative affect associated with poor performance than those low in anxiety (very high anxiety, $n = 12$, $M = 6.61$, SD = 1.42, very low anxiety, $n = 11$, $M = 4.67$, SD = 1.98). Low correlations were revealed among anxiety and idiosyncratic affect scales (Table 3).
Discussion

In support of the first hypothesis, low overlap among the PANAS items and the idiosyncratic items was found. Theorists using a circumplex model of affect might wonder whether non-overlapping PANAS items and idiosyncratic items are really different. In Russell’s (1980) circumplex model, affect items are placed along two bipolar dimensions of low–high arousal and pleasure–displeasure. Using this model, slightly different words may occupy the same affective space. For example, calm and relaxed are low-arousal pleasant adjectives, whereas tense and aggressive are high-arousal unpleasant adjectives. In the present study, these items were amongst the most selected idiosyncratic emotions not in the PANAS. Each of these emotions, together with several others, was perceived as either pleasant or unpleasant by different participants and therefore placed into opposite spaces of the pleasure–displeasure dimension. It is apparent that athletes may attach a different meaning to the same performance-related emotion descriptor. The adoption of an idiographic approach to assessing emotions is thus warranted to tap accurately the individual athletic experience. This is in agreement with Hanin and Syrjä (1995a) and Syrjä and Hanin’s (1997) contention that normative scales are neither individually relevant nor reliable measures of performance affect. An implication for research on emotion-performance relationships at the individual level is that idiosyncratic positive and negative affect scales seem to be more suitable than normative scales. Nevertheless, standardised tests may provide useful information at the group level while idiographic scaling gives insight into the athlete’s sport experience. The advantages of adopting mixed nomothetic-idiographic approaches in sport psychology are documented and advocated by several authors as fruitful procedures for research and practical purposes (e.g. Dunn, 1994; Robazza et al., 1998b, in press; Strean & Roberts, 1992).

A related issue that requires future research concerns the construct validity improvement of idiosyncratic scales. As noted, dissatisfaction with normative measures has shifted the interest of several authors towards individualised scales such as those used in this study. Participants were presented with an affect list, with randomly arranged emotions, in order to identify or generate cognitive labels best describing their psychological pre-competition experience. Yet, physiological reactions concomitant with the emotional experience were missing in the idiographic scaling, although they are in standardised questionnaires such as the somatic anxiety scale of the SAS or the CSAI-2. Hence, a range of performance-related, emotional-arousal symptoms (muscular tension, stomach butterflies, clammy hands, increased heart rate, etc.) should be taken into account to improve the validity of idiosyncratic scales. Like the affect list, a physiological reaction list should be developed to prompt participants to identify or generate physiological items relevant to the individual.

The second hypothesis of the study was also confirmed since support for the notion of reversal effects on the functional impact and hedonic tone of emotions was found. Same items, whether positive or negative, where functionally reversed, that is they were perceived as effective for some athletes and debilitating for others. These results parallel those of previous research (Hanin & Syrjä, 1995a, 1995b; Robazza et al., 1998a). Likewise, same items, whether facilitating or inhibiting, where reversed in hedonic tone, in so far as they were experienced as positive or negative by different performers. These outcomes replicated those of Robazza et al. (1998a), showing the importance of making individuals reflect about the facilitating–debilitating, positive–negative dimensions of their own emotions, in order to gain deeper insight into performance
experience. As recommended, physiological items should complement affect items in idiographic scaling. Functional and hedonic reversals of performance-related emotions are also expected to emerge on concomitant physiological reactions. Future research should address this issue.

Differences in the intensity of the four performance-emotion content categories was analysed according to the third goal of the investigation. Higher values were found for positive affect associated with optimal performance, compared to all other affect categories, for both normative and idiosyncratic affect scales. On the other hand, lower intensity of the facilitating-negative category was revealed compared to the facilitating-positive category. In agreement with previous research (Robazza et al., 1998a), negative emotions seem to be perceived as benefiting performance when moderate in intensity. This group-level finding, of course, does not generalise for all athletes since some competitors may perceive high levels of negative emotions associated with optimal performance. Future research should clarify whether (and what) performance or personality factors determine the athlete’s functional and hedonic preference for specific affect content categories. Functionality or hedonic shifts of emotions caused by intensity changes should also be tested. For example, reversals may be expected to occur associated with an increase in anxiety for those performers perceiving low levels of anxiety as facilitating-positive and, conversely, perceiving high levels of anxiety as inhibiting-negative.

Regarding the fourth hypothesis, trait anxiety intensity measured by the SAS was found to predict negative affect intensity assessed by the PANAS normative subscales. Specifically, high anxiety performers experienced higher levels of negative affect associated with poor performance than those low in anxiety. Analysis yielded somewhat different findings when idiosyncratic affect scores were taken into account. Trait anxiety intensity predicted idiosyncratic negative affect intensity only when contrasting very high anxiety individuals with their very low anxiety counterparts. These results may be interpreted in the light of recent sport-related research on the nature of individual differences in the interpretation of anxiety symptoms. Jones and colleagues introduced the notion of “direction” of anxiety into the competitive anxiety literature referring to the perceived facilitative or debilitative effects of the symptoms upon performance (Jones, 1995; Jones, Hanton, & Swain, 1994; Jones & Swain, 1995; Jones, Swain, & Hardy, 1993). For example, two athletes may experience the same level of cognitive or somatic anxiety prior to competition. However, one of them may interpret those symptoms as hindering forthcoming performance, whereas the other may feel the anxiety as an indication of optimal psychophysical condition to perform.

Empirical support for the notion that anxiety can have facilitative or debilitative effects upon performance was found using the CSAI-2 (Martens et al., 1990) modified to include a direction response scale together with the intensity scale. In the present study, lack of significant differences in idiosyncratic negative affect of high and low competitive anxiety individuals may have been due to most athletes’ interpretation of their symptoms as facilitative to performance. This explanation would agree with Jones and Swain’s (1992) finding that most athletes perceive their anxiety symptoms as facilitative. Yet, a very high anxiety intensity possibly interpreted as debilitative may explain the findings of the significant difference in the idiosyncratic negative affect of very high competitive anxiety performers compared to those very low in anxiety. A direct test of this explanation might be conducted assessing anxiety symptoms on both intensity and direction dimensions, and measuring idiosyncratic affect. Along with intensity and direction, adding an hedonic tone scale to rate anxiety symptoms in the negative–positive continuum would likely
provide further data to increase predictability of idiosyncratic affect level. Hence, high competitive anxiety performers interpreting their symptoms as debilitating-negative are expected to experience a range of inhibiting-negative emotions higher in intensity than low anxiety performers perceiving their symptoms as facilitative-positive. In addition to competitive trait anxiety, other enduring factors (e.g. self-confidence) might be scrutinised for their effects upon individual emotions and performance, thus providing a more complete understanding of the relationships among sport-specific personality factors and idiosyncratic affect.

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