# IDIOSYNCRATIC DESCRIPTION OF ANGER STATES IN SKILLED SPANISH KARATE ATHLETES: AN APPLICATION OF THE IZOF MODEL

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KEY WORDS: Anger, emotion, IZOF model, idiographic approach, karate.

ABSTRACT: This study examined content and intensity of anger prior to, during, and after best ever and worst ever performances in 43 high-level Spanish karate athletes using individualized anger profiling. Optimal and dysfunctional anger intensities were assessed using a modified version of Borg's Category Ratio (CR-10) scale. Anger profiling was supplemented with positive and negative emotion profiling. As expected, content of anger descriptors was highly idiosyncratic. Moreover, great variability in optimal and dysfunctional anger intensities was found at individual and group levels. In best performances, anger was related to the generation of additional energy, whereas in worst performances, anger resulted from a perceived lack of resources or low readiness to perform. Athletes generated different anger descriptors in performance and in non-sport performance situations (overlap ranged from 0 to .35). The results support the use of an idiographic approach in the study of anger states.

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PALABRAS CLAVE: Ira, emoción, modelo IZOF, enfoque idiográfico, kárate.
RESUMEN: El estudio examina el contenido e intensidad de estados de ira antes, durante, y después de los mejores y peores rendimientos en 43 karatekas españoles de alto nivel mediante perfiles de ira individuales. Las intensidades de ira óptima y disfuncional se midieron con la escala modificada de Borg (CR-10). Perfiles de emociones positivas y negativas complementaron los perfiles de ira. Como se creía, el contenido de los descriptores de ira fue altamente idiosincrático. Asimismo, hubo gran variabilidad en las intensidades de ira óptima y disfuncional a nivel individual y de grupo. La ira estaba relacionada con la generación de energía en los mejores rendimientos, pero fue el resultado de una falta percibida de recursos o preparación en los peores rendimientos. Los karatekas utilizaron distintos descriptores de ira en situaciones de rendimiento deportivo y fuera del deporte (solapamiento 0 a .35). Los resultados sustentan el uso de un enfoque idiográfico en el estudio de los estados de ira.

Athletes' subjective emotional experiences play an important role in competitive sports. The accurate description of these situational emotional experiences, the relatively stable patterns they exhibit, and the meta-experiences related to successful and unsuccessful performances (Hanin, 2003) is of growing interest in the practice of sport psychology. Traditionally, these experiences have been measured using normative and group-oriented self-report scales with "fixed" researcher-generated emotion content with the emphasis on subjects' ability to read and understand items. However, the relevance of the item content to individuals is usually not known (Hanin, 2000). Previous research has revealed a discrepancy between the content of items in normative scales and the idiosyncratic vocabulary used by athletes (Syrjä and Hanin, 1997a, 1997b; Hanin, Jokela, and Syrjä, 1998; Robazza, Bortoli, Nocini, Moser, and Arslan, 2000). The present study applies the Individual Zones of Optimal Functioning (IZOF) model (Hanin, 1997, 2000, 2003), as an idiographic and reality-grounded approach to exploring anger states in skilled karate athletes, in an attempt to provide a descriptive database for future explanatory and predictive studies.

In this study, individualized and reality-grounded (Hanin, 2000, 2003) as well as phenomenological (Dale, 1996) approaches are taken, laying emphasis on the description of the athlete's subjective experiences from a self-referent perspective.

*Anger: Conceptualization and Measurement*

In an attempt to clear the conceptual confusion in the definition of anger, hostility and aggression, Spielberger, Johnson, Russell, Crane, Jacobs, and Worden (1985) proposed the notion of the "AHA Syndrome" standing for anger, hostility and aggression. Anger, placed at the core of the AHA Syndrome, was defined as "an emotional state that consists of feelings that vary in intensity, from mild irritation or annoyance to fury and rage" (Spielberger, et al., 1985, p. 7). Hostility was defined as a complex set of attitudes that motivate aggressive behavior, and aggression referred to destructive behavior directed towards other persons or objects.

Most researchers have conceptualized anger as an emotional state; emphasizing different components. For instance, Schachter and Novaco (cited in Spielberger et al., 1985) called attention to both the physiological and cognitive aspects of anger, whereas Feshbach (1964) regarded anger as "a mediating affective response with expressive components." Lazarus (1991, 2000) placed importance on cognitive, motivational, and relational aspects of emotions, arguing that emotions were psychologically mediated by appraisals of the personal significance for well-being that a

person attributes to his or her relationship (relational meaning) with the environment. Included in a list of 7 positive (e.g., happiness, joy), and 8 negative (e.g., anger, anxiety) emotions, Lazarus proposed "a demeaning offense against me and mine" as the core relational theme for anger (see Lazarus 2000, p. 234 for a review of the 15 core relational themes).

Based on the state-trait distinction, Spielberger, Jacobs, Russell and Crane (1983) developed the State-Trait Anger (STAS) scale to assess the intensity of anger as an emotional state and a relatively stable disposition to experience anger. Moreover, Spielberger et al., (1985) also argued for the importance of distinguishing the expression / suppression of anger from the experience of anger, which lead them to construct the Anger Expression (AX) scale.

However, in the IZOF model a wider perspective is taken. Anger is conceptualized as a component of performance-related states, which can be described in at least five dimensions: form, content, intensity, context, and time. Anger is characterized by a specific constellation of subjective emotional experiences closely related to cognitive, affective, motivational, bodily, kinesthetic, operational, and communicative modalities of the psychobiosocial state. From this multidimensional perspective, it is clear that these modalities provide a relatively complete description of performance-induced anger states (Hanin 1997, 2000). In mainstream psychology, most research attention has been paid to kinesthetic and bodily components of anger, focusing on the impact of anger on well-being and general health. However, other components, such as cognitive or motivational components, for instance, especially relevant in sport, have received less attention (Isberg, 2000).

Emotion content is usually categorized in terms of single or "basic" emotion syndromes, such as anxiety, anger etc. (Lazarus, 2000) or as a global affect based on hedonic tone or positivity-negativity distinctions (Watson and Tellegen, 1988). Examples of standardized scales representing the first approach are the STAXI (Spielberger, Reheiser, and Sydeman, 1995), and the Profile of Mood States (POMS; McNair, Lorr, and Droppleman, 1971). The STAXI consists of 44 items contained in five primary scales (State Anger, Trait Anger, Anger-In, Anger-Out, and Anger-Control) whereas the POMS contains six scales (vigor, anger, depression, tension, confusion, and fatigue). Anger measures based on the global affect approach include the Positive and Negative Affect scales (PANAS; Watson and Tellegen, 1988), and the Affect Balance Scale (Derogatis, 1975). However, a sport-specific measure of situational anger has not yet been developed (Isberg, 2000).

In sports, several studies have used the POMS to predict performance using Morgan's (1980) iceberg profile (high vigor and low tension, depression, confusion, anger, and fatigue). However, equivocal empirical support has been found. For instance, studies in karate have showed that successful athletes scored higher in anger than unsuccessful athletes (McGowan and Miller, 1989; McGowan, Miller, and Henschen, 1990; Terry and Slade, 1995). McGowan, Pierce, and Jordan (1992) found that less experienced (black-belt) athletes scored higher on anger prior to competition than higher-ranking black-belts. Arruza, Balagué, and Arrieta (1998) found similar results in the pre-competition profiles of three elite judo competitors, showing again higher anger scores.

In contrast to such normative scales, the IZOF model emphasizes the idiosyncratic

nature of performance-induced anger states, combining the single or "basic" emotion syndromes and the global affect approach. Thus, emotion content is categorized within the framework of four emotion categories derived from hedonic tone (pleasant-unpleasant) and functionality (optimal-dysfunctional) distinctions. These emotion categories are pleasant and functionally optimal emotions (P+), unpleasant and functionally optimal emotions (N+), pleasant and dysfunctional emotions (P-), and unpleasant and dysfunctional (N-) emotions. These four categories provide a broad structure that can accommodate a wide range of idiosyncratic, athlete-generated emotion labels reflecting emotional experiences and available resources (Hanin 2000, 2003). These idiosyncratic labels can be re-categorized into existing classifications of discrete emotion syndromes (anger, anxiety etc.) This study examines the most accurate and individually relevant descriptors of situational anger states related to karate performance.

Intensity can be expressed in either objective or subjective metrics, and is typically measured on a selected parameter of a particular modality. In the IZOF model, the intensity dimension of anger is conceptualized at the individual level, using the in-out of the zone notion that describes a range of intensities producing optimal, neutral, or dysfunctional effects on performance.

Although intensity is a quantitative attribute of subjective experiences (Hanin 1997, 2000), it can also be described qualitatively. Proposing the concept of item-intensity specificity, Spielberger (1970) argued that items vary in their ability to discriminate among different intensities. For instance, the item, "*I feel rested*," in the state anxiety subscale, discriminates changes in

anxiety at low levels of intensity. In contrast, the item, "*I feel over-excited and rattled*," discriminates changes in anxiety at high levels of intensity. Similarly, the items "*upset*," "*annoyed*," and "*irritated*" (STAXI) qualitatively imply less intensity than such items as "*enraged*," "*furious*," and "*flared up.*"

Of all dimensions describing performance-related states, intensity related to optimal and dysfunctional anxiety (see Jokela and Hanin, 1999 for a meta-analysis), and positive and negative emotions (Hanin and Syrjä 1995a, 1995b, 1996) is probably, the most studied. As applied to anxiety, for instance, the IZOF model holds that each athlete has an individual optimal intensity level (high, moderate, or low) within which the probability of successful performance is high. These optimal and dysfunctional intensity levels vary within and across different athletes (Hanin 1997, 2000). However, research has not systematically addressed the optimal and dysfunctional intensity of anger in sport (Isberg, 2000). This study explores the intra-individual dynamics and inter-individual differences in the intensity of athletes' anger states related to successful and poor performances.

Moreover, the IZOF model uses the notion of resource matching to explain the functional impact of emotions on performance. Optimal emotions reflect the availability of resources and their effective recruitment and utilization. In contrast, dysfunctional emotions reflect a lack of resources and their ineffective recruitment and utilization. This study uses the notion of resource matching to examine the perceived meaning of anger related to best and worst performances.

Athletes' anger states are examined with the focus on the differences between their subjective experiences in two qualitatively extreme contexts, best ever and worst ever

performances. Given the multiplicity of factors that can influence athletes' performance, an individualized athlete-referenced criterion will be used, taking into account the athlete's performance quality process irrespective of whether it produces best ever or worst ever outcome results.

The study explores athletes' experiences across three functionally different but interrelated situations: (a) pre-event (preparation for action), (b) mid-event (task execution), and (c) post-event (evaluation of performance).

The purpose of this exploratory study, then, was to examine the content and intensity of anger and anger-related symptoms in skilled Spanish karate athletes, prior to, during, and after best ever and worst ever (hereafter best and worst) performances, using an idiographic approach. On the basis of the assumptions of the IZOF model (Hanin, 1997, 2000, 2003) it was hypothesized (1) that anger content is individual and reflected in the idiosyncratic selection of descriptors, and (2) that optimal anger intensity, helpful for individual performance, can be high, moderate, or low and that it varies among individuals. This study also explores athletes' (a) perception of the functional meaning of optimal and dysfunctional impact of anger on performance, (b) reasons for anger related to karate performance, and (c) anger states in typical (non-sport) settings. Additionally, other positive and negative emotions related to karate performance will be briefly examined.

## Method

### Subjects

Participants in this study were 43 (28 male, 15 female) Spanish karate athletes aged from 15 to 29 years (M=19.26,

SD=3.11). Their sporting experience ranged from 7 to 19 years (M=12.74, SD=2.62). Thirty-one athletes competed in kumite (fighting) and 12 in kata. Thirty-one athletes were highly skilled competitors, being members of the National Team (n=21), participating at the pre-selection of the World Championships (n =8), and in international competitions (n =2). Twelve athletes competed at the national level.

An interview guide, including the following IZOF-based methodology was developed to gather the data:

*Individualized emotion profiling* is used to identify the idiosyncratic content and intensity of optimal and dysfunctional emotions. This stepwise procedure identifies positive and negative emotions subjectively meaningful in terms of the individual's past performance history and significant emotional experiences. In individualized emotion profiling, athletes generate individually relevant emotion words that best describe their optimal (helpful) and dysfunctional (harmful) positive and negative emotions. To help athletes generate individual items, the global emotion stimulus list is used. The English version of the stimulus list was compiled through the selection and revision of items from the 10 global affect scales described by Watson and Tellegen (1985). The list includes 40 positive emotions and 37 negative emotions. Examples of positive items include "*active,*" "*calm,*" and "*confident*"; negative items include "*nervous,*" "*uncertain,*" and "*angry.*" Hanin and Syrjä (1996), reported high reliability for the idiosyncratic emotion scales in a sample of high-level soccer players (mean Cronbach alphas ranging from .76 to .90).

In recall emotion profiling, athletes, using the stimulus list, select 4 or 5 positive and then 4 or 5 negative items that best

describe their emotions related to individually successful performances in the past. Then they select 4 or 5 positive and 4 or 5 negative items that describe their emotions related to individually unsuccessful performances. Athletes can also add emotion words of their own choice. Each athlete generates idiosyncratic emotion descriptors for the four emotion categories: P+, N+, P-, and N-. The emotion stimulus list was adapted into Spanish by two experts and used in a pilot study with karate athletes (Ruiz and Hanin, in press).

*Individualized anger profiling.* Similar to individualized emotion profiling, a Spanish stimulus list of anger descriptors was drawn from the following scales adapted into Spanish: the POMS (Balaguer, et al., 1993) (anger-hostility subscale), the STAXI-2 (Spielberger, et al., 2000) (S-Anger and T-Anger subscales), and the PNA (negative emotion list). The dictionary Espasa Calpe (2001) and several other dictionaries on the internet were consulted to identify synonyms for anger. An initial pool of 32 items was generated.

Thirteen native speakers and a University teacher of Spanish served as experts in selecting the most appropriate descriptors used in current spoken Spanish. Seven items were then eliminated (e.g., "vehemente" [vehement], "ultrajado" [outraged]). "Susceptible" [susceptible] was retain as in Spanish, when not followed by the preposition "de" [to], refers to "a person that is easily offended" (Espasa Calpe, 2001).

Next, the 13 experts rated the perceived intensity of the selected items. Using triangulation (Patton, 1990), four experts were asked to rate the words from 0 to 10. Items rated from 0 to 3 were considered as having "low intensity," from 4 to 6 "moderate," and from 7 to 10 "high

intensity." Five experts sorted the items in three groups (high, moderate, or low in intensity). Four experts ranked the words in a continuum (from low to high in intensity). Comparisons of experts' responses obtained through the three methods revealed high overlap. Specifically, scores ranged from .71 to .88 (SD = 0.09) for "strong" (high intensity) items; from .63 to .82 (SD = .1) for items with moderate intensity; and from .82 to .94 (SD = .06) for "weak" (low intensity) items. All the experts' responses were taken into account in categorizing words according to their intensity.

Figure 1 shows the 25 items included in the anger list categorized as high (in bold), moderate (in italics), and low in intensity. As the figure shows, the content overlap between the anger list and other scales including anger items was low, ranging from 0.2 to 0.35.

*Emotion Intensity.* A separate scale related to intensity was used alongside each athlete-selected emotion. The intensity scale asked, "How much of this feeling or emotion is usually helpful (or harmful) for your performances in competition?" Athletes could indicate either a level or a range of intensity. Intensity was assessed on the modified Borg's Category Ratio (CR-10) scale (Borg, 1982; Hanin, 2000). The CR-10 scale, constructed to avoid the ceiling effect, has been used in other emotion studies (Hanin and Syrjä, 1995a, 1995b). In this study the standard format of the CR-10 scale (Hanin, 1994; Hanin, Syrjä, 1995a, 1995b) translated into Spanish was used with the following verbal anchors: 0= nothing at all, 0.5= very, very little, 1=very little, 2= little, 3= moderately, 5=much, 7= very much, 10= very, very much, _ = maximal possible (no verbal anchors were used for 4, 6, 8, and 9).
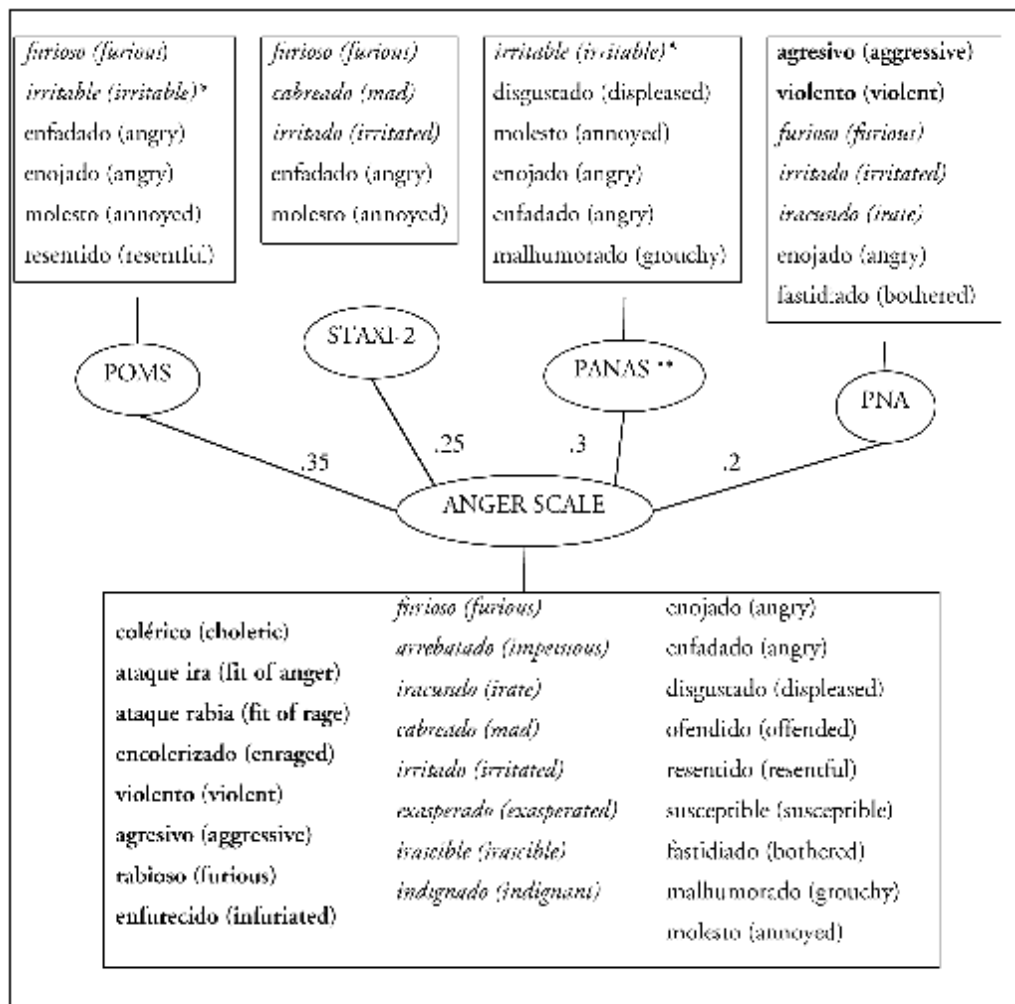
*Figure 1. Anger items and content overlap in general and sport-specific scales.*
*Note. Bold - strong intensity items; italics - moderate intensity items; normal text - low intensity items.*
*\*changed for "irritado"*
*\*\*Sandín, et al. (1999)*

### Procedure

Athletes were individually contacted (a) during the pre-selection for the World Championship (n =27), (b) via coaches from a provincial federation (n =12), and (c) after a training session at the High Performance Centre (CAR) in Madrid (n =4). The purpose and the assessment procedures of the study were briefly explained. An informed consent was obtained after the

voluntary nature of participation was explained and an assurance of confidentiality given. Demographic information about athletes' age, gender, sporting experience, and skill level was obtained. Athletes were asked to recall their best and worst performances, and to give details about the performance situation and their states. Idiosyncratic emotional profiles, using the global emotion and anger lists were generated. Specifically, athletes were asked to select 4 or 5 positive emotion words, 4 or 5 negative, and 4 or 5 anger words that best described their states prior to their best performances. They could also add their own words to describe their states. Following the same procedure, athletes were asked to select 4 or 5 words from each of the positive, negative, and anger lists, to describe their states during, and after their best performances. They then repeated the process for their worst performances. The intensity of each of the selected items was rated on the CR-10 scale. Athletes were asked to indicate whether each emotion (or set of emotions) was helpful (or harmful) for their performance, and report in what way they affected their performance. After the emotion profiling was completed, each athlete was requested to select, from the same anger stimulus list, 4 or 5 items that best described their typical angry state in non-sport settings. Athletes then identified the causes for their anger by completing the sentence "What makes you angry, irritated, or furious during a combat / kata?" Sessions that lasted approximately 45 minutes were tape-recorded.

### Data Analysis

First, all the interviews were transcribed verbatim. Forty-three profiles containing positive, negative, and anger emotion descriptors for best and worst performances,

and their intensity were generated (a sample of an emotion profile is available upon request). Anger descriptors were compiled separately for prior to, during, and after best and worst performances, to examine intra- and inter-individual variability. A degree of similarity-dissimilarity between athletes' descriptors was assessed by calculating content overlap, using the formula proposed by Krahé (1986), and applied to emotion contrasts (Hanin 1997; Hanin, Jokela and Syrjä, 1998; Syrjä and Hanin, 1997a, 1997b). Overlap scores vary from 0 (all descriptors across two situations are different) to 1 (all descriptors are similar). Athletes' perceptions of the impact of anger on performance and causes for anger were inductively and deductively analyzed (Patton, 1990). Inductively, themes containing a single idea or meaning were identified. Each theme concerning the perceived impact was deductively analyzed based on the concept of resources recruitment and utilization. Causes for anger were analyzed according to Lazarus' (2000) relational themes.

## Results

### Selection of Anger Items

The results revealed that 31 and 41 athletes (for N=43) selected anger items to describe their states in best and worst performances, respectively. Specifically, to describe their states prior to and during best performances, 26 and 25 athletes selected anger items. Six athletes reported angry feelings after performances. In worst performances, 20 athletes prior to, 34 athletes during, and 40 athletes after performances, reported angry feelings. As expected, anger was related to performance outcomes and more often experienced after worst performances $((\chi^2)(2) = 19.4, p \leq .001)$

## Anger Content

Athlete-generated descriptors for anger states in pre-, mid-, and post-best and worst performance situations were different. Specifically, in best performances, mean content overlap was low between the descriptors selected for anger states prior to and during (.35) (for n =20 athletes), and during and after (.07) (n =5) performance situations. All descriptors selected for states prior to and after performances were completely different (n =5). Similarly, in worst performances, low content overlap was found in descriptors for pre- and mid-event (.2) (n =18), mid- and post-event (.32) (n =33), pre- and post- event (.22) situations (n =20). Content overlap of descriptors selected across performances was also low (ranging from .11 to .24). Moreover, at the inter-individual level, low overlap was found between descriptors selected for states prior to (.09), during (.16) and after (.05) best performances. Similarly, low overlap scores were found for pre- (.07), mid- (.13) and post-worst (.19) performances.

Table 1 presents a summary of the 3 most selected positive, negative, and anger descriptors of athletes' states prior to, during, and after best and worst performances at the group level (N=43). Athletes' anger states were accompanied by a constellation of positive and negative emotions. The content of anger and other emotions was variable across the states reported prior to, during, and after best and worst performance situations. Moreover, the results revealed differences in the frequency of anger descriptors selected for their content intensity. Specifically, in best performances, athletes used "strong" (high intensity) items (e.g., "aggressive" [agresivo]) to describe their anger states in pre-event and mid-event (about half of descriptors used) situations more often than "weak" (low intensity) (e.g., "bothered" [fastidiado]) or items with moderate intensity (e.g., "indignant" [indignado]). In contrast, in worst performances, athletes selected "weak" items more often to describe their states prior to, during and after performance (about half of descriptors used).

## Anger Intensity

Intra-individual analysis of anger intensity across pre-, mid-, and post-best and worst performances was carried out for 31 and 41 athletes, respectively. The results revealed that in best performances, anger intensity increased for 15 athletes and decreased for 13 athletes from pre- to mid-event situations, and decreased from mid- to post-event situations for 21 athletes. In contrast, in worst performances, intensity increased from pre- to mid-event situations for 22 athletes or remained unchanged for 12 athletes. From mid- to post-event situations, anger intensity increased for 24 athletes and, interestingly, decreased for 11 athletes.

Moreover, anger intensity (on the CR-10 scale) was low (ranging from 0 to 3), moderate (from 4 to 7), or high (from 8 to 11) prior to, and during best performances, and prior to worst performances. For instance, in best performances, anger intensity was low for 5 athletes, moderate (12 athletes), and high (9 athletes). Similar results were found for states during best performances and prior to worst performances. However, during and after worst performances anger intensity was moderate or high.

Figure 2 shows mean anger intensities selected to describe states prior to, during, and after best and worst performances at the group level. Scores ranged from 0 (nothing at

| | Performance situations | | | | |
|---|---|---|---|---|---|
| Prior to | | N | During | N | After | N |

| BEST PERFORMANCES | | | | | |
|---|---|---|---|---|---|
| Pos. | energetic (enérgico) | 22 | comfortable (cómodo) | 15 | happy (feliz) | 20 |
| | optimistic (optimista) | 19 | motivated (motivado) | 14 | glad (contento) | 16 |
| | active (activo) | 18 | fast (veloz) | 14 | relaxed (relajado) | 16 |
| Ang. | **aggressive (agresivo)** | 7 | **aggressive (agresivo)** | 10 | displeased (disgustado) | 2 |
| | susceptible (susceptible) | 6 | **violent (violento)** | 6 | *irritated (irritado)* | 2 |
| | *mad (cabreado)* | 5 | **furious (rabioso)** | 5 | **aggressive (agresivo)** | 1 |
| Neg. | anxious (ansioso) | 16 | anxious (ansioso) | 9 | cansado | 14 |
| | nervous (nervioso) | 15 | nervous (nervioso) | 9 | nervous (nervioso) | 9 |
| | concerned (preocupado) | 14 | restless (inquieto) | 7 | anxious (ansioso) | 6 |

| WORST PERFORMANCES | | | | | |
|---|---|---|---|---|---|
| Pos. | willing (dispuesto) | 10 | alert (alerta) | 8 | relaxed (relajado) | 7 |
| | dashing (desafiante) | 9 | motivated (motivado) | 6 | carefree (despreocupado) | 5 |
| | relaxed (relajado) | 9 | carefree (despreocupado) | 5 | dashing (desafiante) | 3 |
| Ang. | annoyed (molesto) | 5 | bothered (fastidiado) | 9 | *mad (cabreado)* | 18 |
| | **aggressive (agresivo)** | 4 | annoyed (molesto) | 9 | bothered (fastidiado) | 14 |
| | bothered (fastidiado) | 4 | *furious (furioso)* | 8 | angry (enojado) | 12 |
| Neg. | nervous (nervioso) | 13 | worried (intranquilo) | 10 | depressed (deprimido) | 11 |
| | frightened (asustado) | 11 | insecure (inseguro) | 9 | dissatisfied (insatisfecho) | 10 |
| | concerned (preocupado) | 11 | tense (tenso) | 9 | unhappy (triste) | 10 |

*Note. Pos. = positive emotion descriptors; Ang. = anger descriptors; and Neg. = negative emotion descriptors.*

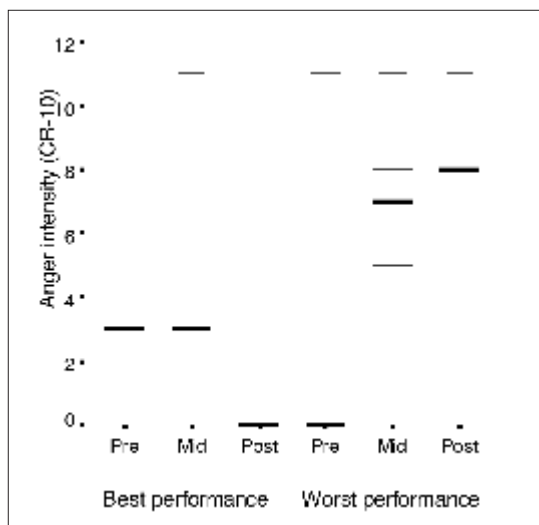*Table 1. Most selected positive, negative and anger items at the group level (N=43).*

*Figure 2. Box plots of anger intensity prior to, during, and after best and worst performance situations in karate athletes (N=43).*

all) to 11 (maximal possible). As expected, large inter-individual differences were found. In best performances, differences in intensity in pre-, mid-, and post-event situations were significant, $((\chi^2)$ (2) = 16.9, $p<$ .0005). Similarly, differences in intensity were significant across worst performance situations $((\chi^2)$ (2) = 26.3, $p<$ .0005). Moreover, significant differences were found across performances, in mid-event, $((\chi^2)$ (1) = 4.2, $p<$ .05), and post-event situations, $((\chi^2)$ (1) = 28.9, $p<$ .0005).

**Perceived Functional Impact of Anger**

Analysis of athletes' perceptions of the impact of anger revealed helpful or harmful effects upon performance. Specifically, in best performances 26 athletes identified 30 themes, perceiving anger as helpful in preparing for the competition. Moreover, athletes and some coaches deliberately used anger in preparation for performance. Specifically, anger was related to feeling willing to start,

motivated, explosive (22 themes), or used in warming up (3), as one competitor reported: "it's as if I got angry to get ready...to feel stronger...to motivate myself...my coach was also encouraging me...I was motivated to do it strong, fast..." (athlete #37). Feeling angry was also perceived as increasing athletes' confidence (5): "feeling aggressive is good... if I feel aggressive it's like I'm better prepared than my opponent ...and... it's like, hey look out, it's me here!" (#18). During performances, 32 themes on the impact of anger were identified. Feeling anger was perceived in terms of more powerful technique (10 themes), going on the attack more often (8), being more energetic, or maintaining a high level of tension (4), being more alert or watchful (3), being motivated (2), or feeling confident (2) or focused (1). However, two athletes did not perceive the level of anger experienced as helpful. After performances, anger was

related to losing the competition (even where athletes evaluated their performance as the best ever), or was due to specific reasons (e.g., could not share victory with parents).

In contrast, prior to worst performances, athletes' anger was perceived as harmful, resulting from a lack of readiness. Athletes' anger reflected a lack of motivation, strength, or energy to perform (10 athletes). Eight athletes felt anger because of mixed feelings of anxiety, tension, and perceived inability to cope with the situation. However, two athletes perceived being aggressive as helpful. During performances, athletes' anger states were related to feeling too tense, uncomfortable, insecure (12 themes), unable to cope with the situation (10), poor technical performance (6), making mistakes (4), and ineffective focus (4). However, two athletes perceived being aggressive as helpful for their performance. Finally, as expected, most athletes (40 out of 43 athletes) felt anger after performance. Moreover, this anger was self-directed in most cases (only two athletes reported being angry with their opponent or with their coach).

*Causes of Anger in Karate.* Forty-three athletes identified 90 themes related to their reasons for anger in karate performance. In 31 cases, athletes described predominantly anger states not referring to other emotions. Examples of such themes were "the referee makes mistakes," "the opponent does not play fair." However, athletes also experienced mixed feelings related to five basic emotions proposed by Lazarus. Specifically, athletes' described shame in 27 cases "loosing with an opponent of inferior skill level"; guilt in 18 cases "performing badly," sadness in 8 cases "I can't get my goal", anxiety in 6 cases "have to compete not being prepared", and envy in 6 cases "referee gives the point to the opponent instead of me." Moreover, in the

case of kumite competitors (fighting against a real opponent), athletes' anger was directed to others (e.g., opponent, referee) or was self-directed (about half of the statements, respectively). In contrast, kata athletes (fighting with an imaginary opponent) usually directed their anger to themselves (about three quarters of all statements).

**Anger Descriptors in Non-Sport and Sport Settings.**

All 43 athletes selected an average of 4.5 (SD = 1.3) items to describe their anger states in typical (non-sport) settings. Of the 25 descriptors used by the athletes, 22 were included in the anger stimulus list, and three new words were added. The selected descriptors included "weak" (about half of the descriptors) and "moderate" (about a third of all descriptors) rather than "strong" items.

Table 2 shows the anger descriptors generated in non-sport and sport settings. Group level comparisons revealed low overlap between items describing athletes' anger in non-sport and in performance situations. Specifically, the mean of the overlap scores between items in non-sport and in best performance situations was .24 (SD = .23) and between items in non-sport and in worst performance situations was .29 (SD = .22).

## Discussion

This exploratory study examined the content and intensity of anger and anger-related symptoms prior to, during, and after best ever and worst ever karate performances. Athletes experienced anger in both, best and worst performances, with more frequent anger experiences after worst performances (40 out of 43 athletes). The low overlap scores (ranging from 0 to 0.35) found between the items describing athletes' anger

| Best Performances [1] | n | Worst Performances [2] | n | Non-Sport situations [3] | n |
|---|---|---|---|---|---|
| aggressive (agresivo) | 18 | mad (cabreado) | 28 | mad (cabreado) | 23 |
| furious (furioso) | 9 | bothered (fastidiado) | 27 | grouchy (malhumorado) | 20 |
| furious (rabioso) | 9 | displeased (disgustado) | 23 | furious (furioso) | 15 |
| mad (cabreado) | 9 | furious (furioso) | 19 | angry (enfadado) | 15 |
| susceptible (susceptible) | 9 | angry (enfadado) | 17 | displeased (disgustado) | 13 |
| violent (violento) | 8 | angry (enojado) | 17 | susceptible (susceptible) | 12 |
| infuriated (enfurecido) | 6 | annoyed (molesto) | 17 | irritated (irritado) | 11 |
| irritated (irritado) | 6 | irritated (irritado) | 17 | furious (rabioso) | 10 |
| angry (enfadado) | 4 | grouchy (malhumorado) | 13 | offended (ofendido) | 10 |
| resentful (resentido) | 4 | indignant (indignado) | 12 | annoyed (molesto) | 9 |
| bothered (fastidiado) | 3 | aggressive (agresivo) | 10 | violent (violento) | 8 |
| fit of rage (ataque rabia) | 3 | furious (rabioso) | 6 | irascible (irascible) | 7 |
| choleric (colérico) | 2 | resentful (resentido) | 6 | infuriated (enfurecido) | 7 |
| displeased (disgustado) | 2 | violent (violento) | 6 | bothered (fastidiado) | 6 |
| fit of anger (ataque ira) | 2 | susceptible (susceptible) | 5 | angry (enojado) | 5 |
| irascible (irascible) | 2 | fit of anger (ataque ira) | 4 | aggressive (agresivo) | 5 |
| angry (de mala leche) ** | 1 | fit of rage (ataque rabia) | 4 | resentful (resentido) | 4 |
| angry (enojado) | 1 | irascible (irascible) | 4 | exasperated (exasperado) | 3 |
| annoyed (molesto) | 1 | infuriated (enfurecido) | 2 | fit of rage (ataque rabia) | 2 |
| enraged (encolerizado) | 1 | offended (ofendido) | 2 | fit of anger (ataque ira) | 2 |
| grouchy (malhumorado) | 1 | choleric (colérico) | 1 | impetuous (arrebatado) | 2 |
| indignant (indignado) | 1 | exasperated (exasperado) | 1 | vengeful (vengativo) ** | 1 |
| irate (iracundo) | 1 | irate (iracundo) | 1 | cross (mosqueado) ** | 1 |
|  |  |  |  | angry (mala leche) ** | 1 |
|  |  |  |  | indignant (indignado) | 1 |

Note. 1 (n = 31); 2 (n = 41); and 3 (n = 43).
** Athletes own words.

Table 2. Athlete-generated anger descriptors in best, worst performance and non-sport situations.

states prior to, during, and after best and worst performances, supports the notion that anger content is highly idiosyncratic (hypothesis 1). This finding accords well with earlier studies revealing low overlap between items in individualized and normative scales (Hanin, 1997; Syrjä and Hanin, 1997a, 1997b; Hanin, Jokela, and Syrjä, 1998). These results emphasize the appropriateness of using idiosyncratic measures of individually relevant emotion content. Such idiosyncratic measures are especially important in individualized interventions.

The results also revealed the idiosyncratic nature of anger intensity (hypothesis 2), indicating that optimal (or dysfunctional) anger intensity could be low, moderate, or high for different athletes. Moreover, high inter-individual variability was found in optimal and dysfunctional intensity (Figure 2), lending support to earlier research on optimal and dysfunctional anxiety (Hanin, 1986, 1995; Pons, 1994; Pons, Balaguer, and García-Merita, 1999; Roca, Pérez, and Lázaro, 1991; Raglin, 1992; Raglin and Hanin, 2000), and positive and negative emotions (Hanin 1997, 2000; Hanin and Syrjä 1995a, 1995b). Future research should now examine the practical utility of the in-out of the zone notion as applied to optimal and dysfunctional anger in the prediction of athletic performance.

The recall of best and worst performances was used in this study as this procedure captures well the most significant aspects of athletes' past performance history. It also allows for the examination of athletes' emotional experiences in pre-, mid-, and post-event situations without interfering with their performance. The results revealed changes in anger content and intensity across pre-, mid-, and post-event situations.

This finding provides support for the notion that the three performance situations: pre-event (anticipation of, preparation for an action), mid-event (task execution, action itself), and post-event (evaluation of performance) are interrelated but functionally different (Hanin 2000). These results emphasize the need for an examination of emotion dynamics and the temporal patterns of emotions to improve our understanding of emotion-performance relationships (Cerin, Szabo, Hunt, and Williams, 2000; Hanin, 1997, 2000). More studies should examine the temporal dynamics of anger throughout specific or across several competitions. Although previous studies provide support for the accuracy of recalled anxiety (Hanin, 1986, 1989), and other positive and negative emotions (Hanin and Syrjä, 1996; Jokela and Hanin, 1999) in most memorable events there is also a clear need for future studies contrasting anger experiences in recalled competitions versus actual performances.

In this study, anger intensity was assessed quantitatively (CR-10 scale) and qualitatively, applying the concept of item-intensity specificity (Spielberger, 1970). The results revealed that "strong" (high intensity) rather than "weak" (low intensity) items were more often used to describe athletes' anger prior to, and during best performances, whereas "weak" items were more often used in worst performances. These differences reflect the specificity of two qualitatively opposite contexts (best and worst performances). The low content overlap between anger descriptors in performance and in non-sport situations also implies context specificity. Such context specificity might explain the inclusion of emotion descriptors with lower intensity in general versus sport-specific scales (Figure 1).

The results also suggest that a possible approach in the construction of task-specific scales could be the aggregation of athlete-generated items. Thus, the most selected anger items would be included in an anger scale for karate, useful for group level analysis.

Athletes' perceptions of the impact of anger on performance revealed both helpful and harmful effects. In best performances, anger was related to readiness to perform (e.g., motivation) and the generation of energy in task execution (e.g., doing stronger). However, in worst performances, anger resulted from a perceived lack of resources (e.g., making mistakes) or low readiness to perform, associated with feelings of anxiety or tension. Thus, these results support the notion that optimal emotions are related to the generation and effective utilization of energy, whereas dysfunctional emotions reflect the lack of availability of resources or their ineffective utilization (Hanin 1997, 2000); however, anger seems to be more helpful in the generation of additional energy than in its effective use. The findings suggest that examining athletes' meta-experiences (knowledge, beliefs, and attitudes) of their anger and its impact on performance is a valuable source of information for the applied psychologists, since athletes' meta-experiences are involved in emotion regulation. Furthermore, the functional impact of anger was influenced by the experience of other positive and negative emotions. Therefore, future research should examine separate and interacting effects of anger and other positive and negative emotions.

The results revealed that perceived reasons for anger not only described "pure" anger states but also "mixed" emotions.

Interestingly, athletes' self-generated labels described only five emotions (shame, guilt, sad, anxiety, and envy) from the list of the fifteen discrete emotions proposed by Lazarus. These findings concur well with other research (Ruiz and Hanin, in press) that lends support to the notion that emotion content in high-achievement settings is specific. The results also provide additional support for the framework of four (P+, N+, P-, and N-) global emotion categories based on hedonic tone and functionality distinctions that can accommodate a wide range of idiosyncratic emotion labels (Hanin, 1997, 2000, 2003).

Similar to earlier research on optimal pre-competitive anxiety, our findings indicate that anger in the high achievement setting can be both optimal and dysfunctional for different athletes. Moreover, optimal anger intensity can be low, moderate, or high. The existing practice of anger management in non-sport settings, which is focused mainly on its reduction (Brunelle, Janelle, and Tennant, 1999), may be not always effective in sport. Specifically, anger control in sport should not be limited to a reduction of excessive anger intensity where appropriate. In some cases, anger intensity could be increased to generate additional energy and effort and to postpone premature fatigue (Hanin, 2000). To achieve this goal, an alternative to conventional group-oriented approaches should include individualized strategies based on the identification of individual zones of optimal anger and its regulation (increase or decrease). Another promising direction for future research would be to focus on clusters of anger "mixed" with other emotions both positive and negative.

# References

Arruza, J.A., Balagué, G., and Arrieta, M. (1998). Rendimiento deportivo e influencia del estado de ánimo, de la dificultad estimada, y de la autoeficacia en la alta competición. *Revista de Psicología del Deporte* 7, 193-204.

Balaguer, I., Fuentes, I., Meliá, J. L., García-Mérita, M.L., and Pérez-Recio, G. (1993). El perfil de los estados de ánimo (POMS): Baremo para estudiantes valencianos y su aplicación en el contexto deportivo. *Revista de Psicología del Deporte, 4*, 39-52.

Borg, G. (1982). A category scale with ratio properties for intermodal and interindividual comparisons. In H.-G. Geiss and P. Petzold (Eds.), *Psychophysical judgement and the process of perception* (pp. 25-34). Berlin: VEB Deutscher Verlag der Wissenschaftern.

Brunelle, J. P., Janelle, C. M., and Tennant, L. K. (1999). Controlling competitive anger among male soccer players. *Journal of Applied Sport Psychology, 11,* 283-297.

Cerin, E., Szabo, A., Hunt, N., and Williams, C. (2000). Temporal patterning of competitive emotions: A critical review. *Journal of Sports Sciences, 18*, 605-626.

Dale, G. A. (1996). Existential phenomenology: Emphasizing the experience of the athlete in sport psychology research. *The Sport Psychologist, 10*, 307-321.

Derogatis, L. R. (1975). *Affect balance scale.* Baltimore: Clinical Psychosomatics Research.

Diccionario Espasa Calpe (2001). Available from http://www.elmundo.es/diccionarios

Feschbach, S. (1964). The function of aggression and the regulation of aggressive drive. *Psychological Review, 71, (4)*, 257-272.

Hanin, Y. L. (1986). State-trait anxiety research in the USSR. In C.D. Spielberger and R. Diaz-Guerrero (Eds.), *Cross cultural anxiety* (Vol. 3, pp. 45-64). Washington, DC: Hemisphere.

Hanin, Y. L. (1989). Interpersonal and intragroup anxiety in sports. In D. Hackfort and C.D. Spielberger (Eds.), *Anxiety in sports: An international perspective* (pp. 19-28). Washington, DC: Hemisphere.

Hanin, Y. L. (1994). Optimization of performance emotions: Individual scaling of performance emotions. *Top performance: Proceedings of the 1st National Congress of Elite Finnish Coaches* (pp. 94-106). Jyväskylä, Finland: KIHU.

Hanin, Y. L. (1995). Individual Zones of Optimal Functioning (IZOF) Model: An Idiographic Approach to Performance Anxiety. In K. Henschen and W. Straub (Eds.). *Sport Psychology: an Analysis of Athlete Behaviour* (pp.103-119). Longmeadow, MA: Movement Publications.

Hanin, Y. L. (1997). Emotions and athletic performance: Individual Zones of Optimal Functioning model. *European Yearbook of Sport Psychology, 1*, 29-72.

Hanin, Y. L. (Ed.). (2000). *Emotions in sport.* Champaign, Illinois: Human Kinetics.

Hanin, Y. L. (2003, February). Performance Related Emotional States in Sport: A Qualitative Analysis. *Forum Qualitative Social Research*, *4* (1). Available at: http://www.qualitative-research.net/fqs-texte/1-03/1-03hanin-e.htm [Feb 26, 2003].

Hanin, Y., Jokela, M., and Syrjä, P. (1998, July). Emotion correlates of successful and poor performances: A comparison of individualised and group-oriented measures. *From Community Health to Elite Sport: Annual Congress of the European College of Sports Science.* Manchester, UK. p.136.

Hanin, Y. L., and Syrjä, P. (1995a). Performance affect in junior ice hockey players: An application of the Individual Zones of Optimal Functioning model. *The Sport Psychologist, 9*, 169-187.

Hanin, Y. L., and Syrjä, P. (1995b). Performance affect in soccer players: An application of the IZOF model. *International Journal of Sports Medicine, 16* (4), 264-269.

Hanin, Y. L., and Syrjä, P. (1996). Predicted, actual, and recalled affect in Olympic-level soccer players: Idiographic assessments on individualized scales. *Journal of Sport and Exercise Psychology, 18*, 325-335.

Isberg, L. (2000). Anger, aggressive behaviour, and athletic performance. In Y. Hanin (Ed.) *Emotions in Sport.* (113-133) Champaign, Illinois: Human Kinetics.

Jokela, M. and Hanin, Y. (1999). Does Individual Zones of Optimal Functioning model discriminate between successful and less successful athletes? A meta-analysis. *Journal of Sport Sciences, 17*, 873-887.

Krahé B. (1986). Similar perceptions, similar reactions: an idiographic approach to cross-situational coherence. *Journal of Research in Personality, 20*, 349-361.

Lazarus, R. S. (1991) Progress on a cognitive-motivational-relational theory of emotion. *American Psychologist, 46* (8) 819-834.

Lazarus, R. S. (2000). How emotions influence athletic performance. *The Sport Psychologist, 14,* 229-252.

McGowan, R. W., and Miller, M. J. (1989). Differences in mood states between successful and less successful karate participants. *Perceptual and Motor Skills, 68*, 505-506.

McGowan, R. W., Miller, M. J., and Henschen, K. P. (1990). Differences in mood states between belt ranks in karate tournament competitors. *Perceptual and Motor Skills, 71,* 147-150.

McGowan, R. W., Pierce, E. F. and Jordan D. (1992). Differences in precompetitive mood states between black-belt ranks. *Perceptual and Motor Skills, 75*, 1, 123-128.

McNair, D. M., Lorr, M., and Droppleman, L. F. (1971). *Manual: Profile of mood states.* San Diego: Educational and Industrial Testing Service.

Morgan, W. P. (1980, July). Test of champions. *Psychology Today*, 14, 102, 108.

Patton, M. Q. (1990). *Qualitative evaluation and research methods.* (2nd ed.) London: Sage Publications.

Pons, D. C. (1994). Un estudio sobre la relación entre ansiedad y rendimiento en jugadores de golf (A study of relationship between anxiety and performance in golf-players) Unpublished Ph.D. Thesis, Universitat de Valencia, Valencia.

Pons, D. C., Balaguer, I.S., and García-Merita, L. (1999). Niveles de Ansiedad en Entrenamiento y tres Situaciones Recordadas de Competición con Distinta Calidad de Rendimiento (Levels of anxiety in training and three recall situations of competition with different quality of performance). *Ansiedad y Estrés,* 5 (*1*), 99 -109.

Raglin, J. S. (1992). Anxiety and Sport Performance. In J.O. Holloszy (Ed.), *Exercise and sports sciences reviews*, (Vol. 20, pp. 243 - 274). Baltimore, USA: Williams and Wilkins.

Raglin, J. S., and Hanin, Y. L. (2000) Competitive anxiety and athletic performance. In: Hanin, Y. L. (Ed.). *Emotions in Sport.* Champaign, Illinois: Human Kinetics. pp. 93-111, 2000.

Robazza, C., Bortoli, L., Nocini, F., Moser, G., and Arslan, C. (2000). Normative and idiosyncratic measures of positive and negative affect in sport. *Psychology of Sport and Exercise, 1* 103-116.

Roca, J., Pérez, G., and Lázaro, I. (1991). Determinación del nivel óptimo de ansiedad en el alto rendimiento competitivo: contribución de los componentes somáticos y cognitivos. *Revista de Investigación sobre las Ciencias de la Educación Física y el Deporte*, 7, 71-79.

Ruiz, M. C., and Hanin, Y.L. (in press). Metaphoric description and individualized emotion profiling of performance related states in high-level karate athletes. *Journal of Applied Sport Psychology*

Sandín, B., Chorot, P., Lostao, L., Joiner, Jr., T. E., Santed, M., and Valiente, R. (1999). Escalas PANAS de afecto positivo y negativo: Validación factorial y convergencia transcultural . *Psicothema, 11,* 37-51.

Spielberger, C. D. (1970). *STAI Manual for the State-Trait Anxiety Inventory.* Palo Alto, California: Consulting Psychologists Press.

Spielberger, C. D., Jacobs, G., Russell, S., and Crane, R. (1983). Assessment of anger: The State-Trait Anger Scale. In J. N. Butcher and C. D. Spielberger (Eds.), *Advances in personality assessment, vol. 2* (pp. 161-189). Hillsdale, NJ: Erlbaum.

Spielberger, C. D., Johnson, E., Russell, S., Crane, R., Jacobs, G., and Worden, T. (1985). The experience and expression of anger: Construction and validation of an anger expression scale. In M. Chesney and R. Rosenman (Eds.), *Anger and hostility in cardiovascular and behavioral disorders* (pp. 5-30). Hemisphere: McGraw-Hill.

Spielberger, C. D., Reheiser, E. C., and Sydeman, S. J. (1995). Measuring the experience, expression, and control of anger. In H. Kassinove (Ed.), *Anger disorders: Definitions, diagnosis, and treatment.* (pp.49-67). Washington, DC: Taylor and Francis

Spielberger, C. D., Tobal, M., Casado and Cano V. (2000). *Inventario de Expresión de Ira Estado-Rasgo -STAXI.* Madrid: TEA Ediciones.

Syrjä, P. and Hanin, Y. (1997a, July). Measurement of emotion in sport: a comparison of individualised and normative scales. In: R. Lidor and M. Bar-Eli (Eds.). *ISSP IX World Congress of Sport Psychology.* Proceedings, Part 2, pp.682-684. Netanya, Israel: Wingate Institute.

Syrjä, P. and Hanin, Y. L. (1997b, August). Individualised and group-oriented measures of emotion in sport: a comparative study. *Annual Congress of the European College of Sports Science.* (Book of abstracts. Part II, pp. 641-642). Copenhagen, Denmark: University of Copenhagen.

Terry, P. and Slade, A. (1995). Discriminant effectiveness of psychological state measures in predicting performance in Karate competitions. *Perceptual and Motor Skills, 81*, 275-286.

Watson, D., Clark, L. and Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS Scales. *Journal of Personality and Social Psychology, 54*, 1063-1070.

Watson, D. and Tellegen, A. (1985). Towards a consensual structure of mood. *Psychological Bulletin, 98,* 219-235