

# FLUCTUATION OF COGNITIVE-EMOTIONAL STATES DURING COMPETITION: AN IDIOGRAPHIC APPROACH\*

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*FLUCTUATION OF COGNITIVE-EMOTIONAL STATES DURING COMPETITION: AN IDIOGRAPHIC APPROACH*

KEYWORDS: Affective states, Cognitive processes, Sport, Trapshooting.

ABSTRACT: The purpose of this paper is to describe athletes' cognitive-emotional processes during competitions through an idiographic and ecologically valid study method based on verbal protocols and event sequential analyses. A world-class marksman and regional-level marksman filled in an affect grid after each shot during several competitions. Verbal reports were collected after each set by a delayed retrospective recall method and compared according to perceived performance periods. Event sequential analyses were conducted. The results showed distinct interpersonal patterns of affective states fluctuations and self-regulation strategies. Furthermore, intrapersonal patterns as a function of perceived performance were also identified. We suggest that the proposed methods are useful in studying athletes' cognitive-emotional processes during ongoing competitions, as they ensure high ecological validity and provide in-depth information for more effective, individually-tailored interventions.

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## Introduction

Lazarus' (1999) Cognitive-motivational-relational theory of emotion has been a popular conceptual framework in explaining emotional processes. According to Lazarus' model, emotions result from subjects' relational meaning of a person-environment relationship, which is interpreted in terms of its impact in subjects' well being. People make decisions based on appraisal processes, through which the transaction is judged to be essential in maintaining, enhancing or hindering one's well being –*primary appraisal*– and on whether there is anything that can be done about the transaction –*secondary appraisals*. When subjects perceive that there is something of adaptational importance at stake, that the transaction encompasses risk taking, stress develops and subjects engage in appraisal processes. Lazarus also emphasizes adaptational coping as subjects exert cognitive and behavioral efforts to manage the stressful person-environment relationship. Coping strategies can focus on mobilizing efforts to change aspects of the situation –*problem-focused coping*– or regulating the emotions aroused by the situation without changing it –*emotion-focused coping* (Lazarus and Folkman, 1984). Endler and Parker (1990) added *avoidance-coping* as another dimension, which consists on an individual's decision to withdraw from a particular stressful task or to engage in another activity.

Sport psychology researchers' interest in coping in sport is not new (e.g., Crocker and Isaac, 1997; Gould, Eklund and Jackson, 1993), but its interaction with appraisal processes and emotions have only recently been studied within an overall cognitive-motivational-relational framework (e.g., Cerin, Szabo, Hunt and Williams, 2000;

Lazarus, 2000). Researchers suggest that performers utilize a combination of problem-focused coping and emotion-focused coping to manage stressful competitive events, and its use is mediated by perceived control over the situation (e.g., Hammermeister and Burton, 2004). Experts seem to use preferably problem-focused coping, while non-experts utilized more emotion-focused coping (Gaudreau and Blondin, 2002). Problem-focused coping or task-related strategies have been shown to predict positive affect, while emotion-focused coping have been shown to predict negative affect (Ntoumanis and Biddle, 1998). In addition, stability in coping and affects seem to be influenced by goal attainment (Gaudreau, Blodin and Lapierre, 2002).

Advocating a unitary approach to the study of appraisals, coping and emotions (Lazarus, 1999), Skinner and Brewer (2002) suggest that subjects utilize more emotion-focused coping under conditions of threat, and problem-focused coping when perceiving challenge. Furthermore, it was suggested that subjects have certain threat and challenge appraisal styles which predict the way athletes tend to appraise stressful situations (Skinner and Brewer, 2004). Appraisals and coping develop in a dynamic set of recursive relationships (Holt and Dunn, 2004) as the relational meaning of the situation can change as the encounter unfolds due to the reciprocal interaction between appraisals, emotions and coping (Kim and Duda, 2003).

With the exception of Holt and Dunn's (2004) study, in which a qualitative approach was undertaken, the above studies have relied on standardized paper-and-pencil assessment measures typically administered before or/and after competitions or practices. Recently, a line of research has been developed in which self report of affective states are

provided by golfers (Cohen, Tenenbaum and English, 2006), tennis players (Golden, Tenenbaum, and Kamata, 2004; Johnson, 2000), and archers (Johnson, Edmonds, Moraes, Medeiros Filho, and Tenenbaum, 2007) during the competition using the Affect Grid (Russell, Weiss and Mendelsohn, 1989) to determine Individual Affect-related Performance Zones (IAPZs; Kamata, Tenenbaum and Hanin, 2002). The present paper draws on the on-line measurement of affective states and adds to the previous studies by attempting to concomitantly describe thought processes.

The purpose of the paper is to describe fluctuations of emotional states and cognitive processes in two trapshooters of different skill levels using an idiographic and ecologically valid method based on verbal protocols and event sequential analysis.

## Method

### Participants

*A* was a 58-year old male veteran athlete who had 28 years of competitive experience. *A* had dropped to the fourth-category because he did not complete the preceding season. He competed 15 years as a second-category athlete and 11 years as a third-category athlete. He estimated participation in eight competitive events and performed an average of 150 shots per month in practice during the previous 12 months. This athlete was placed 4<sup>th</sup> in the Southern Region Championship in Olympic Trapshooting (1991, category of "veterans"), 1<sup>st</sup> in the Portuguese Championship in Trench Shooting (1994, "veterans"), and 1<sup>st</sup> in the Federation Cup (1995, "veterans").

*V* was a 59 year-old elite male athlete who had 30 years of experience in competitive events, 29 of which as a first-category

marksman. *V* reported participation in a total of 10 competitive events in the last 12 months, and estimated 600 shots monthly during practice, on average. His athletic history includes winning a European Championship and a World Cup in 2003. He was also the World Champion as a team member and three times National Champion. In the year data collection took place, *V* won the Absolute Portuguese National Championship.

### Instruments

The *Affect Grid* (Russell et al., 1989). The affect grid was used to record judgments about singular instances of affect along two dimensions: pleasantness and arousal. Because it is an extremely quick self-report measure of affect, it was suitable for use in obtaining data during a competitive event without being invasive. The affect grid consists of 81 cells arranged as a square of 9 rows by 9 columns. The rows define arousal level and the columns define pleasure level. Following the stem "How do you feel *right now?*," athletes were asked to mark the appropriate cell. By choosing the appropriate cell, participants simultaneously reported both aspects of their current affective state. A pleasure score was obtained by counting the number of squares along the horizontal axis. Possible scores range from 1 (*extremely unpleasant*) to 9 (*extremely pleasant*). An arousal score was obtained by counting the number of squares in the vertical axis. Possible arousal scores also range from 1 (*minimal arousal*) to 9 (*maximal arousal*). Affect grid reliability, convergent validity and discriminant validity are supported by four studies conducted by Russell et al. (1989), in which college students were asked to describe the meaning of emotion-related words, and feelings communicated by facial expressions, and current mood.

## Performance Measures

*Objective performance.* Objective performance was the *shot outcome*, operationalized as a *hit* or a *missed* target. Hits were further divided into *hit with the first shot* (H), and *hit with the second shot* (H2).

*Subjective performance.* After each shot, participants answered the question "How do you rate the quality of the previous shot?" using a 9-point Lickert scale response (*Poor* = 1; *Excellent* = 9).

*Perceived performance periods.* These periods derived from the retrospective delayed verbal protocols and were operationalized as non-critical and critical. *Non-critical performance periods* consisted of periods during the competition in which athletes evaluated their performance as "optimal," "good" or "easy." *Critical performance periods* were periods during the competition in which performance was perceived as "poor," "difficult" or "problematic."

## Task

Trapshooting is an individual sport that consists of using a shotgun to hit a clay target which is released at athletes' voice by computerized machines placed 15 meters in front of a firing line. The machines are programmed to randomly select target's flight in varying degrees of height and direction. The firing line is composed of five shooting stations; athletes change station after each target. There are a maximum of six athletes per firing line competing simultaneously in each set of 25 targets. Shooting order is alternated among shooters. A maximum of two shots are allowed to hit each target.

A's data was collected during the Portuguese Cup in Trapshooting, which was disputed in eight sets of 25 targets during two days, with a total of 200 targets. V's data was collected during two competitions of the

Trapshooting Portuguese Championship. Each competition was composed of six sets of 25 targets, during two days, with a total of 150 targets per competition. V's data derived from 300 targets.

## Delayed Retrospective Recalls

After each set, verbal reports were elicited by a delayed retrospective recall method to identify athletes' cognitive processes during the competition. Guidelines were followed to avoid interfering with subjects thought sequences (Ericsson and Kirk, 2001). In particular, to avoid reporting generalizations (i.e., what the subject usually thinks or believes he or she should think), and forcing subjects to provide explanations for their thoughts, reports focused on specific thoughts that subjects unmistakably remembered having had.

The researcher elicited a timeline of critical events experienced during the competition. Subjects were asked to provide detailed descriptions of moments that represented shifts in their feelings and/or performance. Once shifts in feelings or performance were defined, the researcher began *process tracing*. Process tracing involved: (1) redirecting the subject to the first critical moment and prompting recall of thoughts and feelings immediately before and after it, and (2) recall thoughts and feelings as the critical period developed until the next critical event. Prompts referring subjects to their next thought and checks concerning degree of confidence on recalled thoughts and feelings were used throughout this process.

## Procedure

Before each set, athletes were given a pencil and a pocket size notebook containing the necessary *Affect Grid* forms for the 25

targets. During the competition, athletes monitored their affective states using the *Affect Grid*. They filled in a grid before the initial shot and immediately after each shot. Athletes also assessed perceived performance on separate 9-point Likert-type scales. This procedure was introduced in the trapshooters routine after a period of practice. Because the time it requires to be performed is very short (3-5 seconds), and because it often takes place when athletes are occupying their new position in the firing line, this procedure was considered by athletes to be non-invasive and non-disruptive of the preparation for the next shot. Therefore, it is believed that high ecological validity was assured. Immediately after each set, athletes were interviewed for collection of verbal protocols utilizing a delayed retrospective recall method (Ericsson and Simon, 1993). The researcher collected the notebook and provided a new one.

### Coding Verbal Protocols

Verbal reports were transcribed verbatim, encoded in categories and analyzed for thought content and sequence of events. Categories were based on Lazarus' Cognitive-motivational-relational theory of emotion (Lazarus, 1999):

(a) *threat appraisals* (THR), which consists of verbalizations conveying the possibility of future damage occurring as a result of a given outcome from the transaction;

(b) *challenge appraisals* (CHG), which consists of verbalizations conveying enthusiasm about the struggle to overcome the obstacles posed by the transaction;

(c) predominantly *problem-focused coping* (PFC), consisting of verbalizations indicating attempts to manage or alter the problem causing the distress;

(d) predominantly *emotion-focused coping* (EFC), consisting of verbalizations indicating

attempts to regulate emotional responses to the problem, and

(e) *withdrawal coping* (WTH), consisting of verbalizations indicating wishes to withdraw from a particular stressful task or to engage in another activity.

Inter-rater reliability estimates reached an agreement rate of 93.7% after inclusion of a third judge to resolve disagreements. Cohen's *kappa* reached .91.

### Analysis of Event Sequences

Verbal data was utilized to describe the sequences of discrete events during the competition. The designation of "events" pertains to athletes' verbalizations and shot outcomes. Event sequential data represent sequences or chains of coded events (Bakeman and Gottman, 1997). These sequences were analyzed with the Discussion Analysis Tool (DAT; Jeong, 2003) system. DAT was developed to do sequential analysis in which the probabilities of a given event being elicited by a preceding event, or probabilities of specific types of events being likely to follow a given event are calculated. The frequency of each target-event is transformed into relative frequencies, or transitional probabilities. Transitional probabilities are the probabilities with which a particular "target" event (T) occurred, relative to another "given" event (G); the probability of T, given G (Bakeman and Gottman, 1997). In addition, the observed transitional probabilities between events are converted into state transitional diagrams, graphical illustrations that support the identification and analysis of patterns of event sequences. Each event category is represented by a node, which is linked to another node by directional arrows. These arrows represent the direction of the transitional probabilities between nodes and their density illustrates the strength of these probabilities (Jeong, 2004).

## Results

### Participant A

A placed 25<sup>th</sup> in the final rank of his category, among 27 athletes, scoring 146 out of 200 (146/200, 73%).

#### *Affective dimensions and performance.*

Figures 1a,b represent fluctuation of pleasure, arousal and perceived performance reported by A during his competition.

Arousal was steady at high levels (7 and above) throughout the entire competition: A marked level 7, 3.7% of the times; level 8, 82.1%, and level 9, 14.2%. Even though pleasure was also stable within each set (with the exception of sets 3 and 4), it fluctuated considerably in different sets. Overall, pleasure levels ranged from 3 to 8, with 7 being the most reported (40%). Also, in 81.6% of the shots, A considered experiencing pleasant feelings (i.e., > 5). A perceived his performance as poor on 27.4% of the shots, moderate on 4.2%, and optimal on 68.4%.

*Verbal reports.* Figure 2a,b represent the state transition diagrams for critical and non-critical periods of seven of the eight sets of A's competition. These diagrams illustrate sequential data analysis of verbal reports obtained from DAT (Jeong, 2003).

Figure 2a shows that even though when A perceived his performance as good, he experienced *threat* and *missed targets*. However, he often reported being unaffected by these misses, and always used *emotion-focused coping*. Similarly, when appraising *threat* A engaged in *problem-focused coping*. Probabilities of occurrence of the sequences *miss* → EFC ( $z = 4.01, p < .05$ ), and *threat* → PFC ( $z = 3.10, p < .05$ ) were significantly higher than expected (i.e., more likely to occur than the remaining paired sequences). EFC was significantly more likely to be followed by a hit target ( $z = 2.41, p < .05$ ) and, to a lesser

degree, by PFC and challenge. PFC and challenge, in turn, were both more likely to result in hits, but with probabilities of occurrence no different than expected.

After hitting a target, the majority of A's verbalizations were also EFC-related, but the type of strategies appears to differ from those used after misses. After a hit, coping appear to have the purpose of self-reassurance (e.g., "all is controlled"); after a miss, A was often being able to distance himself from the outcome (e.g., "I was undisturbed" or "unaffected") or accepting responsibility for the miss (e.g., "bad execution").

Three patterns emerge from inspection of the state transitional diagram during the critical performance periods (Figure 2b): (1) *challenge appraisals* were nonexistent, (2) there was a relationship between threat appraisals, missed targets and EFC, and (3) PFC followed hits. A often made *threat appraisals*, particularly after missing a target ( $z = 2.91, p < .05$ ). After perceived *threat*, he attempted to cope utilizing EFC strategies (25%; 5 occasions), rather than PFC (5%, 1 occasion) strategies. However, after *threat appraisals*, A was more likely to proceed to the next target, and apparently without attempting to cope: 55% (11 occasions) of threat appraisals are followed by missed targets ( $z = 2.37, p < .05$ ).

After missing a target, A was significantly more likely to use EFC ( $z = 2.47, p < .05$ ), to experience *threat* ( $z = 2.91, p < .05$ ) or to engage in *withdrawal* ( $z = 1.64, p = .05$ ). PFC was utilized only once after a missed target, in order to diagnose. In turn, EFC was significantly more likely to be followed by a missed target ( $z = 2.22, p < .05$ ). PFC strategies were significantly more likely to be followed by successful shots (4 occasions, 67%;  $z = 4.99, p < .05$ ), or by another PFC strategy (2 occasions, 33%;  $z = 1.75, p < .05$ ).

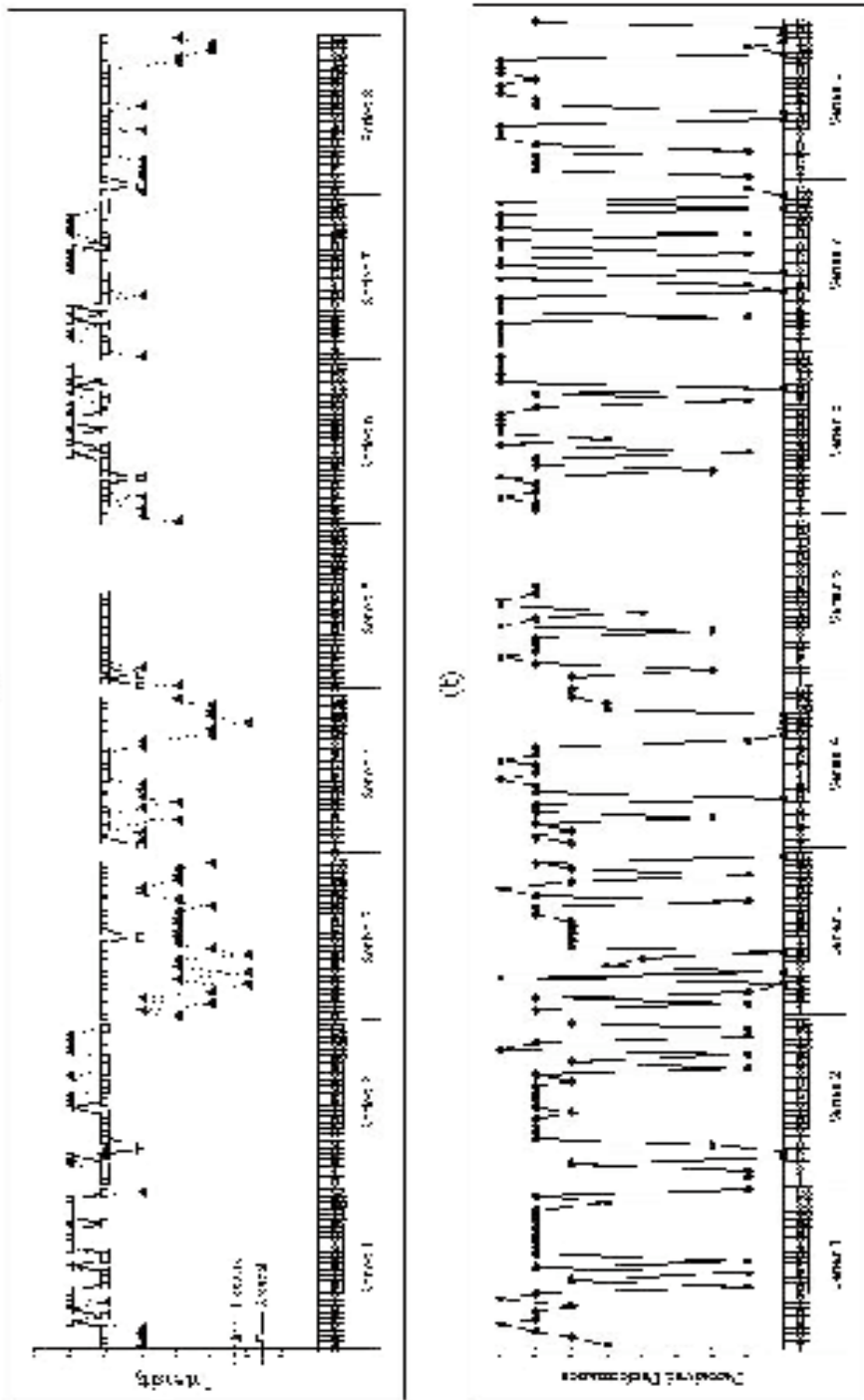
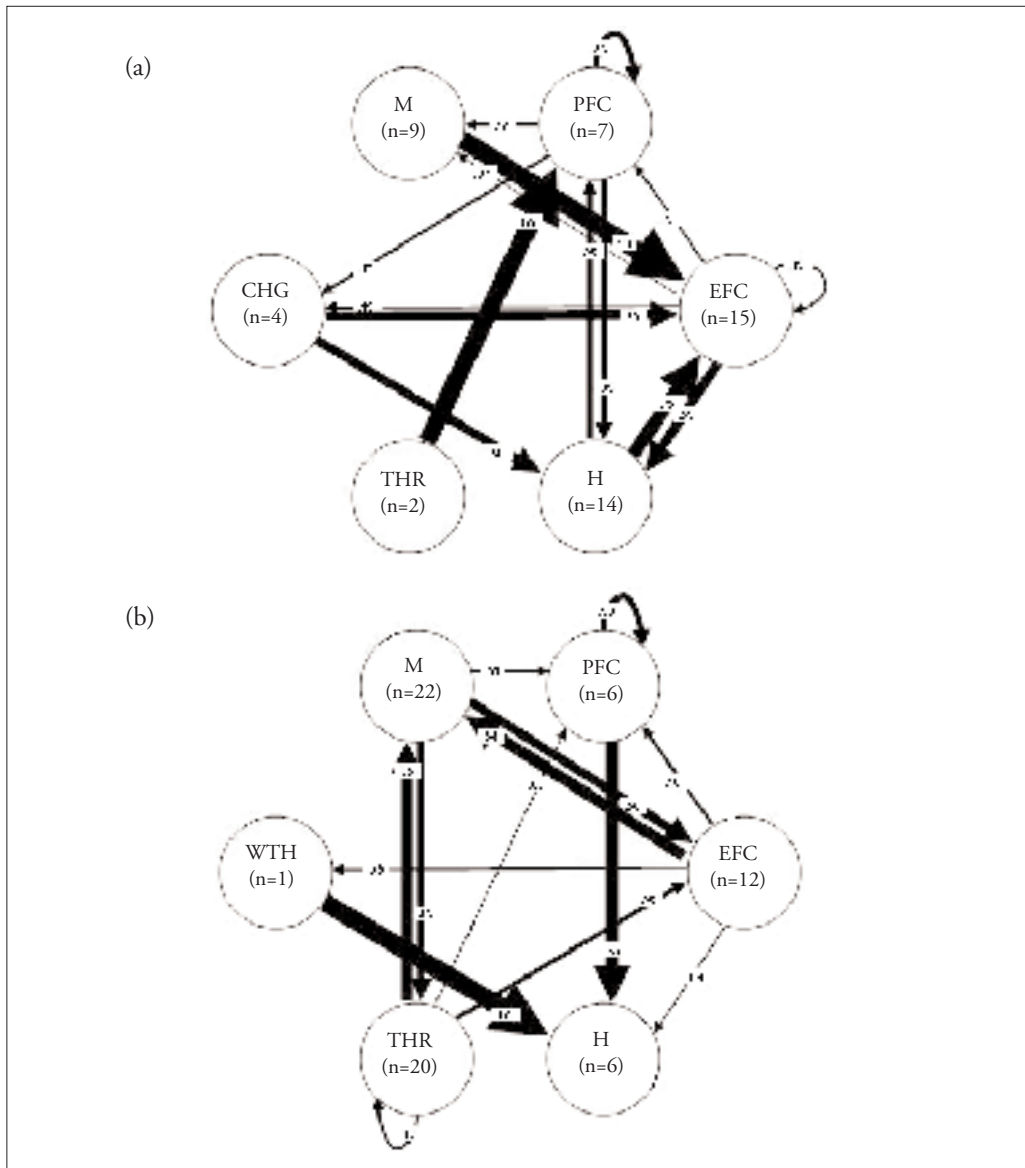


Figure 1. Fluctuations of (a) pleasure and arousal, and (b) subjective performance after each shot during A's competition.



M = Miss; PFC = Problem-focused coping; EFC = Emotion-focused coping; H = Hit; THR = Threat; CHG = Challenge; WTH = Withdrawal.

Figure 2. State transitional diagrams of event sequences during (a) non-critical, and (b) critical performance periods of A.



### Participant V

V was the absolute winner (146/150, 97.3%) on both competitions when data was collected. In the final rank of the Olympic Trap Shooting National Championship 2005, V was placed 1<sup>st</sup> with a final score of 439/450 (97.6%).

*Affective states and performance.* Fluctuations of pleasure and arousal levels, and perceived performance for V's first competition are presented in Figure 3a,b respectively.

Pleasure and arousal levels were stable throughout both competitions. Pleasure levels were rated 8 (41.0%) and 9 (59%). Arousal levels were rated 7 and above (7, 0.7%; 8, 90.7%; 9, 8.7%). V evaluated 98.7% of the shots as excellent and 1.3% as moderate performance.

*Verbal reports.* Sequence analysis of V's verbal reports center only on critical periods due to limited information provided during non-critical periods. Memory for thoughts during non-critical moments was poor; however, during critical moments, V was more aware of his thoughts.

During non-critical periods of the competition, V experienced low threat, reported pleasant affects, not having any particular thoughts, except that thinking one target at a time, and reassuring targets were not problematic. When experiencing some degree of threat, he engaged in PFC. When he appraised the competitive situation as "too easy," he redefined his goals in a challenging way (i.e., "hit 25 targets with the first shot") to maintain a certain level of arousal or alertness (i.e., readiness).

V identified critical moments when he missed a target or in some instances when the second shot was required. These critical moments never comprised long periods of time, with the exception of the last 10 targets of the two last series of the second com-

petition. These two periods coincided with this V's awareness that he could win the Absolute Championship; he reported these periods were very stressful and that he was "barely able to control" himself. Nevertheless, he still performed optimally, even though his reports indicated threat experiences, and use of emotional-focused coping (EFC) strategies more often than in the non-critical periods. Figure 4 represents the state transitional diagram for critical periods.

After missing a target (M), V engaged more often in EFC than in PFC. After hitting a target with the first shot (H) or with the second shot (H2), this pattern is more marked. However, after a miss, V attempted to cope with subsequent affects by accepting the responsibility for the miss. The likelihood of V utilizing EFC after a hit with the first shot (100%,  $z = 2.73$ ,  $p < .05$ ) and a hit with the second shot (71%,  $z = 2.03$ ,  $p < .05$ ) are higher than expected. V always hit after using PFC strategies, whether with the first shot ( $z = 2.84$ ,  $p < .05$ ) or with the second shot ( $z = 2.83$ ,  $p < .05$ ).

V also engaged in threat appraisals, particularly in the last two sets of the second competition. The probability of occurrence of two consecutive threat appraisals was higher than expected ( $z = 3.81$ ,  $p < .05$ ). However, after threat appraisals, V engaged in both EFC (4 occasions, 36%) and PFC (3 occasions, 27%). After a missed target, V accepted responsibility for the outcome (e.g., "I knew it was my fault") and was able to distance himself from it (e.g., "it didn't bother me"). This allowed him to proceed to solve the problem at hand (e.g., "changed the positioning of the gun"). After hitting with the second shot, V's verbalizations appeared to have the purpose of self-reassurance rather than distancing. Finally, during these critical periods, hitting with the first shot was often followed by reassuring that all was well.

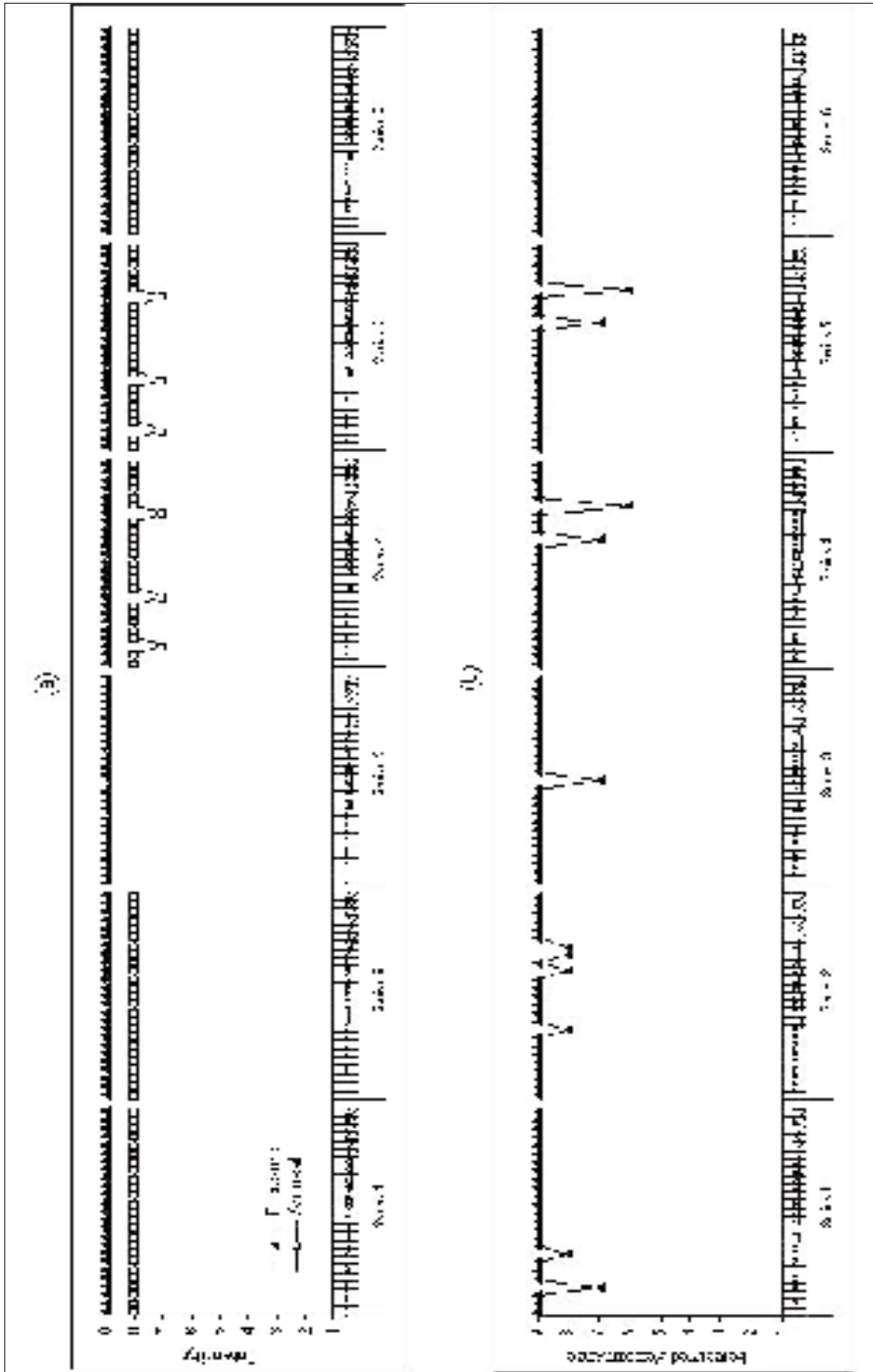
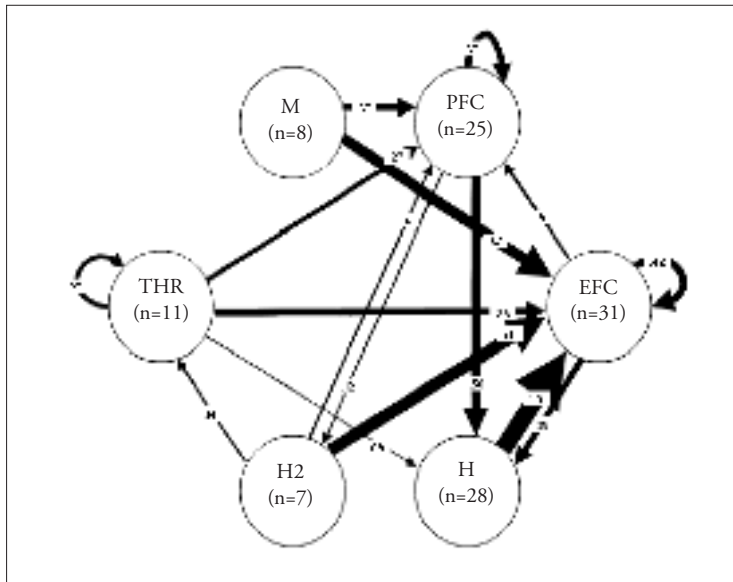


Figure 3. Fluctuations of (a) pleasure and arousal levels and (b) perceived performance for each shot during the six sets of V's first competition.



M = Miss; PFC = Problem-focused coping; EFC = Emotion-focused coping; H = Hit with the first shot; H2 = Hit with second shot; THR = Threat.

Figure 4. State transitional diagram for V during critical moments.

## Discussion

The purpose of this paper is to describe athletes' cognitive-emotional states during competition, based on an idiographic approach involving on-line measurement of affective states, verbal protocols and event sequential analysis. First, fluctuations of affective states will be described. Second, patterns of thought sequences as a function of perceived performance periods are analyzed.

### Fluctuation of Affective States

Participant V had a more stable pattern of emotional states than participant A, regardless of missed targets. Higher-level athletes had been shown to exhibit greater

emotional stability than less successful athletes (Golden et al., 2004; Hanin, 2000). Those who consistently perform better appear to be more efficient self-regulators (e.g., Kitsantas and Zimmerman, 2002) and perform more consistently within their optimal Individual Affect-related Performance Zones (IAPZ; Kamata et al., 2002), which has been associated with the experience of flow states (Golden et al., 2004). Therefore, it is possible that, unlike A, V's streak of successful shots represented performance within an optimal IAPZ. Gaudreau et al. (2002) argue that stability of affects appears to be influenced by goal attainment. Because hitting a target provides an unambiguous feedback concerning performance, the knowledge of results is

likely to support monitoring of progression to goal attainment, and maintenance of optimal affective states.

*A*'s affective scores did not seem to parallel subjective performance evaluations indicating pleasure is derived from other aspects of the participation rather than the outcome. Still, a relationship between pleasure and perceived performance may be observed in the third, fourth and eight sets (i.e., at the end of each competitive day) as pleasure tends to be evaluated less positively. During these moments, in which *A*'s became aware that personal goals were unattainable, he engaged in withdrawal. Behavior disengagement was found to mediate the relationship between negative affective states and perceived discrepancy between performance and goals (Gaudreau et al, 2002). Also, higher levels of self-efficacy and control appraisals were associated with performance (Haney and Long, 1995). Athletes who performed well in a sport task experienced greater control and self-efficacy and used less disengagement coping in a subsequent similar task.

### Event Sequential Analysis during Perceived Performance Periods

*Non-critical performance periods.* Optimal performances have been extensively described as a consequence of complex interaction between discrete positive and negative emotions (e.g., Hanin, 2000; Hanin and Syrja, 1995a; Hanin and Syrja, 1995b; Ruiz and Hanin, 2004). Participant *A* reported both challenge and threat appraisals during good performance periods. Challenge appraisals tended to follow both emotion-focused and problem-focused coping. Interestingly, during these periods, *A* sought for resolution of threat appraisals using problem-focused coping. Under these circumstances, it is

possible that threat might have had a motivational role (Jones and Swain, 1995). Emotion-focused coping was reported more frequently after successful and unsuccessful shots than problem-focused coping, though. However, after hitting targets, *A* engaged in self-reassurance, whereas after missed targets he mainly distanced himself from the situation or accepted personal responsibility for the outcome.

*V* reported that he did not remember having had specific thoughts during non-critical performance periods. Isen (1984) argues that when subjects experience positive affective states, they engage in less cognitive processing, utilizing heuristic processing by using routines and general knowledge structures. However, during critical performance periods, *V* also experienced positive emotional states. Yet, in the presence of a discrepancy between information presented and one's general knowledge structures, subjects are still able to engage in cognitive processing without shifting affective states (Bless, 2001; Schwarz, 2001). On the other hand, as negative emotions indicate a problematic situation that needs to be changed (Schwarz and Bless, 1991), allocation of attention to specific information of the current situation may help improve performance. This higher cognitive effort is bound to leave a more marked memory trace to which access is facilitated by verbal protocol procedures (Ericsson and Simon, 1993). This memory trace is not evident if subjects do not deliberately engage in extensive information processing.

*Critical performance periods.* During critical performance periods, *A* made only threat appraisals. These threats were associated with a high probability of missing targets. In turn, missed targets were considered a threat. When coping with missed

targets, *A* almost exclusively engaged in venting of emotions. Under circumstances of perceived critical performance, threat appraisals might have induced increased cognitive load taking up *A*'s cognitive resources (Eysenck and Calvo, 1992). During these periods, *V* was able to deal with threat by engaging in emotion-focused coping and problem-focused coping. *A* was more likely to proceed to the next shot without apparently attempting to cope. Janelle (2002) argues that experts are more tolerant to threat's cognitive overload than non-experts as "experts appear to be more capable at regulating emotional (specifically anxiety) fluctuations and their physiological manifestations to a greater degree than novices, or even experienced but non-expert performers" (p. 245). In addition, *V* was more likely to use problem-focused coping strategies after emotion-focused coping strategies than *A*. Such pattern of coping may be useful to reduce subjects' emotional experience and allow dealing with the task more efficiently (Lazarus, 1999).

*V* did not perceive missed targets as threats; he focused on the problem and on maintaining emotional control by attempting to distance himself from the situation or assume the responsibility for the miss. When *A* missed targets, his emotion-focused coping was directed towards self-blame and venting. Also, after hits during critical periods, *V* engaged in self-reassurance and control-related thoughts by remembering that his goals were still achievable, while *A* utilized these strategies only during non-critical periods. Perceptions of control may play an important role in prompting such dissimilar coping strategies

(Hammermeister and Burton, 2004).

The dynamic relationships between cognitive appraisals and coping are complex. Researchers have shown that threat is associated with negative expectations of goal attainment, lack of control and negative emotions, while challenge is associated with positive expectations, control and positive emotions; however, event sequential analysis in the present study indicates that there is considerable variability to these patterns. Athletes engage in a variety of coping strategies which vary in accordance to the interaction between contextual constraints and athletes' subjective interpretation of those contextual constraints. As observed for both *A* and *V*, perceiving threat did not always precede the use of emotion-focused coping, nor is this type of coping always associated with negative emotional states. Threat is a primary appraisal which can, under certain circumstances, be soothed by appraisals of control and positive expectations of goal attainment. In addition, they can indicate that something needs to be change in the subject's relation with the environment. Therefore, threat and associated negative affective states can function as a motivational trigger to mobilize resources. This complexity is more likely to be captured by tapping into athletes' cognitive and emotional processes during an actual competition, utilizing for instance on-line measures of emotional states and verbal protocols. It is suggested that longitudinal idiographic approaches that focus on the athlete's phenomenological world are needed to gain in depth information and provide individually tailored interventions.

*FLUCTUACIÓN DE LOS ESTADOS COGNITIVO-EMOCIONALES DURANTE LA COMPETICIÓN: UNA APROXIMACIÓN IDIOGRÁFICA*

**PALABRAS CLAVE:** Estados afectivos, Procesos cognitivos, Deporte, Disparo de precisión.

**RESUMEN:** El objetivo de este artículo es el describir los procesos cognitivo-emocionales de los deportistas durante sus competiciones, utilizando un método de estudio idiográfico y ecológicamente válido basado en protocolos verbales y en análisis secuencial de eventos. Un tirador de precisión de categoría mundial y otro de nivel regional cumplieron un registro de afectos después de cada disparo durante distintas competiciones. Después de cada set de disparos, se recogieron registros verbales mediante un método de evocación retrospectiva, y se compararon de acuerdo los períodos de rendimiento percibido, y se les aplicó un análisis secuencial de eventos. Los resultados han mostrado distintos patrones interpersonales de fluctuaciones en los estados afectivos, así como de estrategias de auto-regulación. Además, se han identificado patrones intrapersonales como función de los rendimientos deportivos percibidos. Se sugiere que los métodos propuestos son útiles para estudiar los procesos cognitivo-emocionales de los atletas durante sus competiciones en marcha, a la vez que se asegura una elevada validez ecológica y se obtiene información en profundidad destinada a diseñar intervenciones más efectivas y más adaptadas a los distintos deportistas.

*FLUTUAÇÕES DOS ESTADOS COGNITIVO-EMOCIONAIS DURANTE A COMPETIÇÃO: UMA PERSPECTIVA IDEOGRÁFICA*

**PALAVRAS-CHAVE:** Estados afectivos, Processos cognitivos, Desporto, Tiro.

**RESUMO:** O objectivo deste artigo é descrever o processo cognitivo-emocional dos atletas durante as competições, utilizando um método de estudo ecológico e ideográfico válido, baseado em protocolos verbais e análise de eventos sequenciais. Uma classe mundial de bom atirador e outra regional, preencheram uma grelha de registo de afectos após cada tiro, durante várias competições. Foram recolhidos relatos verbais após cada set através de um método de evocação retrospectiva, que foram comparados de acordo com os períodos de performance percebidos. Posteriormente desenvolveram-se análises de eventos sequenciais. Os resultados mostraram padrões interpessoais distintos de flutuações dos estados afectivos e de estratégias de auto-regulação. Além disto foram também identificados padrões intra-pessoais em função da performance percebida. É sugerido que os métodos propostos sejam úteis para o estudo de processos cognitivo-emocionais de atletas, durante o decorrer das competições, assegurando uma elevada validade ecológica e providenciando informação crucial para intervenções específicas para cada indivíduo.

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