



## Evaluation of International Affective Picture System (IAPS) ratings in an athlete population and its relations to personality

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### ABSTRACT

The purpose of this study was to evaluate the selected International Affective Picture System (IAPS) pictures for an athlete population. A secondary focus was on whether ratings of IAPS pictures were related to personality traits. A total of 219 athletes participated in the study. Participants viewed 224 pictures that were selected from (IAPS). Ratings in terms of valence and arousal were obtained.

To determine locations of the pictures on valence and arousal dimensions, a scatter plot was drawn: x-axis of the plot was valence and y-axis was arousal. The Turkish affective space figure drawn in accordance with the ratings that were obtained from the sample revealed that the pictures were distributed along each dimension.

A path model was tested to examine the relationship between responses to the picture sets for four regions and personality traits. The results clearly indicated that the path model provided a good fit to the data. Four path coefficients were found to be statistically significant.

Results indicated that IAPS ratings obtained from the Turkish athlete population are comparable with original ratings reported by Lang, Bradley, and Cuthbert (2005). In addition, responses to IAPS pictures was found to be modulated by personality traits.

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### 1. Introduction

Emotions and affective processes have been extensively investigated in the field of human cognition and performance. They have been described as a reaction to a stimulus event (either actual or imagined) involving change in viscera musculature of a person (Hanin, 2007). According to Izard (1977), emotions are multi-faceted in nature as they include behavioral, physiological, and experiential components. They also have a considerable amount of effect on human performance and are, therefore, considered indispensable for research on human cognition and behavior (Jokela & Hanin, 1999).

Hanin (2007), however, observed that an accurate and detailed description of emotional experiences in sport psychology research was often underestimated or simply ignored. Lazarus (2000) also noted that movement scientists are “blissfully” unaware of the relationship between emotion and performance. A wide range of performance contexts precipitate extreme emotional reactions and individuals are constantly under dynamical states of emotional flux (Coombes, Janelle, & Duley, 2005). Performance sports context

is an environment where emotion is an important predictor of athletic performance. Several theories, such as Reversal Theory (Apter, 2001) and Hanin's (1997) Individual Zone of Optimal Functioning (IZOF), have been proposed in an effort to explain emotion and performance relationship in sports.

The IZOF model was developed in the naturalistic elite sports (Jokela & Hanin, 1999) in order to account for detrimental and beneficial effects of pre-competition anxiety (Robazza, Bortoli, & Nougier, 1999). There is a growing consensus in applied sport psychology that the prediction of athletic performance should be based on multiple pleasant (positively toned) and unpleasant (negatively toned) emotions rather than only pre-competition anxiety (Cerin, Szabo, Hunt, & Williams, 2000; Hanin, 2007). The IZOF approach comprises a performance functionality dimension in addition to hedonic (or valence) dimension of emotions. Hanin (2007) classified emotions into one of four global emotion categories derived from hedonic tone and performance functionality: pleasant and functionally optimal emotions (P+), unpleasant and functionally optimal emotions (N+), pleasant and dysfunctional emotions (P−), unpleasant and dysfunctional (N−) emotions. Optimal (P+ and N+) emotional experiences accompany successful performances, whereas dysfunctional (N− and P−) emotional experiences are usually related to poor performances. Based on Lacey's (1967) findings that different subjects tend to respond by activating different major physiological response systems, Hanin's

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IZOF model focuses largely on emotional experiences described by athletes' self-generated idiosyncratic labels. Actually, studies conducted within the IZOF perspective used idiosyncratic subjective scales of emotion adjectives (Bortoli & Robazza, 2002; Hagtveta & Hanin, 2007; Robazza, Bortoli, & Hanin, 2006) and few studies (Bortoli & Robazza, 2002; Robazza, Bortoli, & Hanin, 2004) examined bodily responses associated with emotional experiences.

Unfortunately, studies in sport psychology from time to time tend to overlook objective methods whilst dealing with emotions. For instance, less attention has been paid to examine the influence of emotions on sports related motor or even cognitive tasks in well controlled experimental studies. Hence, no material has been developed to trigger a variety of emotions or no normative data have been obtained from an athlete population for an existing set of emotional stimuli. Yet, the vital status of emotions for the research on human cognition and behavior made it imperative to devise a variety of ways to measure the emotion processes and affective influences on both cognition and behavior.

One of the effective and well-established sources providing researchers with emotional and attentional stimuli is the International Affective Picture System (IAPS) developed by Lang and his colleagues (Lang, Bradley, & Cuthbert, 1995, 1999, 2001, 2005). IAPS consists of over 700 standardized color photographs evoking a range of affective responses. The system includes normative ratings of each photograph with respect to valence (pleasure), arousal, and dominance. These ratings are reliable (Lang et al., 2005) and were collected by using the Self-Assessment Manikin (SAM) which is an affective rating-scale system using a graphical figure that depicts the dimensions of arousal (from an excited to a relaxed figure), valence (from a smiling to a frowning figure), and dominance (from a large to a small figure) (Lang, 1980).

Providing a standardized pool of affective and attentional stimuli, the IAPS has become a highly useful methodological tool used in numerous investigations. A significant portion of these studies employed the IAPS norms to investigate basic processes such as learning, emotion, motivation and attention by a range of psychophysiological measures—skin conductance response (Mardaga, Lalouaux, & Hansenne, 2006), event-related brain potentials (van Lankveld & Smulders, 2008), heart rate (Lang, Greenwald, Bradley, & Hamm, 1993), and electromyographic activity in the forehead (corrugator) and cheek (zygomatic) muscles and fMRI (Lang et al. 1998). Much recently, however, studies on different topics such as aging and Alzheimer's disease (Kensinger, Brierley, Medford, Growdon, & Corkin, 2002), trait anxiety (Yiend & Mathews, 2001) and studies with various methodologies (Bradley, Greenwald, Petry, & Lang, 1992; Cahill & Alkire, 2003; Kern, Libkuman, Otani, & Holmes, 2005) have started to use IAPS.

The aim of this study was to obtain normative ratings of selected IAPS items (pictures) from a population consisting of elite college student athletes. These normative ratings may be useful for researchers willing to study emotions under laboratory conditions. To our knowledge, this is the first study that has used IAPS ratings when analyzing the Turkish population. It is highly possible that these ratings may also contribute to research done on emotions in other related areas. We assume that the ratings of IAPS pictures obtained from our sample are comparable to those reported in the IAPS manual.

Another assumption considered in this study was that personality traits especially Neuroticism can modulate responses to IAPS pictures. Depending on studies (Canli, Sivers, Withfield, Gotlib, & Gabrieli, 2002; Morrone, Depue, Scherer, & White, 2000) showing associations between Extraversion and positive emotions as well as Neuroticism and negative emotions, it seems quite logical to assume a similar relationship between personality traits and responses to IAPS pictures.

## 2. Method

### 2.1. Participants

Two hundred nineteen participants (59 females and 160 males, mean age = 21.17 years) took part in the experiment. Participants were chosen among the elite athletes who were willing to participate in the study. All participants had either normal or corrected-to-normal vision.

### 2.2. Materials

A jury consisting of the three authors selected 224 pictures from IAPS, based on the normative ratings reported in the manual. In addition to these ratings, the jury's opinion was objective and culturally non-biased.

In order to collect the participants' valence and arousal ratings for the selected IAPS pictures, a computer program was designed by using MS Visual Basic 6.0 version. The pictures were presented on a celeron 1.7 GHz PC and 17-inch-computer screen for 5 s. After a 5-s-presentation of each picture, valence and arousal dimensions of the SAM appeared at the bottom of the screen. Participants rated each picture by clicking on one of the 9-point-Likert-type-rating formats of the SAM figures.

### 2.3. Personality analysis

The Five Factor Personality Inventory (FFPI) developed by Somer, Korkmaz, and Tatar (2002) is a 220 item personality inventory designed to assess the five main personality traits; namely Neuroticism, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness. Item responses are made using a five point-format. The inventory's manual provides evidence for reliability and validity of the measurement device.

### 2.4. Procedure

Subjects were divided into groups of 10 to 25 persons. Experimental sessions were conducted in a 25 ft × 40 ft room with similar lighting conditions. Instructions given to the participants were otherwise similar to those reported in the manual with the exception of being modified for a computer-based-rating-procedure. In addition to verbal instructions, a warning slide informing the participants about the rating procedure of each IAPS picture was presented to the participants. Prior to the experimental ratings, all participants viewed and rated 3 practice pictures. Also, the picture order was randomized for every single experiment. After the picture presentations The Five Factor Personality Inventory (FFPI) was given to the subjects in order to assess their personality traits.

## 3. Results

### 3.1. Pictures

The Pearson product-moment correlation between Turkish and American norms regarding valence and arousal dimensions for selected pictures was calculated. Results showed that there was a strong positive correlation ( $r = .95, P < .001$ ) between Turkish and American mean valence values for selected pictures. In terms of arousal ratings, however, there was a smaller but significant correlation ( $r = .72, P < .001$ ) between Turkish and American mean arousal ratings.

In order to determine locations of the pictures on valence and arousal dimensions, mean valence and arousal scores of each picture were calculated. Hence, two scores (mean valence and mean

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