

THE RELATION BETWEEN THE EMOTION OF “ANGER” AND THE COGNITIVE PROCESSES IN GYMNASTICS ATHLETES

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Abstract

The purpose of the present study was to investigate the relationship between anger and morality, achievement goals and athletic identity. It also aims at the investigation of the effect of the type of sport, competitive divisions and gender. 140 athletes of gymnastics sports (artistic, rhythmic, and acrobatic gymnastics) from four different divisions participated in the present study. The participants filled in five questionnaires (the subscale "Anger" of the CAAS; Maxwell & Moores, 2007a, MOSPEQ; Proios, 2010, AIMS; Brewer & Cornelius, 2001, AGSYS; Cumming, Smith, Smoll, Standage, & Grossbard, 2008, AGOM; Stuntz & Weiss, 2003). The results exhibited a significant effect of the type of sport and gender on anger. The results also established a relationship between anger and coach praise orientation – a form of social relationship.

Key words: Anger, morality, achievement goals, athletic identity, gymnastics sports

Introduction

Sport is an environment for the expression of several emotions which play an important role in the participants' functioning. In particular, the significant influence of emotions on decision making (Skoe, Eisenberg, & Cumberland, 2010) might be mentioned. Despite the emergence of a wide range of emotions in sport, the interest of research has been mainly focused on anxiety, largely ignoring other emotions such as anger (Hanin, 2000, Isberg, 2000). Recently, such sentiment started attracting the researchers' interest in the field of sport (e.g. Bolgar, Janelle, & Giacobbi, Jr., 2008; Maxwell & Visek, 2009; Maxwell, Visek, & Moores, 2009).

We consider the study of anger rather important because it is a very frequent emotion (Lerner & Tiedens, 2006) which significantly affects decisions relevant to the individuals' behaviour, making decisions that put others in danger – e.g. aggressiveness (Kerr, 2006; Kirker, Tenenbaum, & Mattson, 2000; Maxwell & Moores, 2007a, 2007b; Visek, Watson, Hurst, Maxwell, & Harris, 2010) or against themselves (e.g. Bodenhausen, Sheppard, & Kramer, 1994; Tiedens, 2001; Tiedens & Linton, 2001). This is probably due to the fact that anger is associated with the perception of human control (Hansen & Hansen, 1988; Smith & Ellsworth, 1985).

Anger is a generic feeling (of malaise and dissatisfaction) of limited to mild intensity. According to Maxwell and Visek (2009), anger has been described as a negative feeling associated with specific cognitive and perceptual distortions and deficiencies (e.g., misappraisals and attributions of blame), physiological changes, and behavioural tendencies (Kassinove & Sukhodolsky, 1995; Novaco, 2000) (p. 238). Deffenbacher (1999) argued that anger is the result of three factors: *external events*, which include identifiable conditions, the others' behaviour, as well as the items and behaviour of individuals themselves; *combination of external events and anger-related memories and images elicited* by them (e.g., in posttraumatic stress victims), and *internal stimuli, usually thoughts or emotions* (e.g., a poor performance review).

In addition, anger is one of the emotions in which cognitive appraisals have been proposed to play important roles (Ohbuchi et al., 2004). Also, Deffenbacher (1999) argued that anger is related to the individual's enduring cognitive characteristics. Among others, apart from emotions, other factors often encountered in sport and incorporate cognitive characteristics can be morality, goal achievement and athletic identity. Greene, Sommerville,

Nystrom, Darley, & Cohen, Haidt, and Walker, Pitts, Henning, & Matsuba (as cited in Skoe, Eisenberg, & Cumberland, 2002) accept that emotion constitutes an important component of moral functioning. Research has addressed the role of emotions, such as empathy and anger, in morality (for more details, see Eisenberg, 2000). Anger has been maintained to lead to prosocial motives and actions, although it has not been adequately assessed as a moral emotion (Haidt, 2003).

Emotions arousal is considered to be generated when something motivationally relevant happens (Berkowitz & Harmon-Jones, 2004). An unfair interference in achievement of goals is a common source of anger (Shaver, Schwartz, Kirson, & O'Connor, 1987); or if people are kept from reaching their goals (Berkowitz & Harmon-Jones, 2004). According to the achievement goal theory, the individual is an intentional, goal-directed organism operating in a rational manner. In this theory, in achievement domains such as sport, two classes of goals predominate, namely task/ mastery and ego/ performance goals, respectively (Ames & Archer, 1988; Duda, 1992; Nicholls, 1989). Apart from achievement goal orientations (task and ego), it is also argued that social goal orientations constitute as well an additional goal of action underpinning behaviour in sport (Hodge, Allen, & Smellie, 2008). Stuntz and Weiss (2003) maintained that social relations in sport are exhibited as different types, such as relations with a close sport friend, the teammates as a group, and the coach.

Anger is often aroused by challenges to important self schema, a blameful attack on one's ego identity a violation of values and expectations, and/or unwarranted interference with goal-directed behaviour (Lazarus, 1991). In sport psychology, instead of the term "identity" the term "athletic identity" is used. Athletic identity refers to the degree to which people are identified with the athlete's role (Brewer, Van Raalte, & Linder, 1993). One's identity as an athlete may then hold identity standards, which are sets of meanings persons hold for themselves in a given role (Burke, 1991). The results of a recent study established that athletic identity was significantly and positively correlated with anger and aggressiveness (Visek et al., 2010).

According to the theorists Lazarus (1999), Lazarus & Folkman (1984), Novaco (1979, 1995), anger is a cognitive model. This model can be related to personal (e.g. personality, coping styles) and contextual (e.g. type of ego involvement, one's goals, cognitive appraisal) components (Novaco, 1995). This leads to the emergence of individual differences in emotions such as anger (e.g. Crocker & Graham, 1995; Wang, Trivedi, Treiber, & Snieder, 2005; Watson, David, & Suls, 1999).

The main purpose of the present study is to investigate the relationship of cognitive construct of anger with other cognitive constructs such as ethics, achievement goal and athletic identity. Since anger is a construct with cognitive characteristics which are different among individuals, in this study any possible differences between anger and the type of sport, sport divisions and gender variables will be considered as well.

Methods

Participants

In the present study, the participants were 140 athletes ($n = 29$ boys and $n = 111$ girls). Their age ranged from 8 to 17 years ($M = 11.86$, $SD = 2.21$). They all participated in three different sports, namely artistic gymnastics ($n = 91$), rhythmic gymnastics ($n = 37$), and acrobatic gymnastics ($n = 12$). The participants were playing in four sport divisions (Division IV, $n = 49$; Division III, $n = 61$; Division II, $n = 20$; Division I, $n = 10$).

Procedures

First of all, the team coaches' consent was asked. Then, the researcher met each team's group of parents separately and, after the scope of the research was explained, their (oral) permission was asked for their children to participate. Eventually, the athletes whose parents

gave their consent filled a questionnaire at the training site and before training started.

Measures

Anger. To measure athletes' anger, the subscale "Anger" of the Competitive Aggressiveness Anger Scale was used (CAAS; Maxwell & Moores, 2007a). This subscale consists of 6 questions (e.g., "I find it difficult to control my temper"). Responses are given on a five point Likert type scale to reflect frequency of occurrence (1 = *almost never* to 5 = *almost always*). The anger subscale reflected frustration provoked by losing points or games, official's mistakes, and anger reactivity in general. The coefficient alpha for this subscale was .71, indicating good reliability.

Moral orientation. Moral orientation was measured using the Moral Orientation Students in Physical Education Questionnaire (MOSPEQ; Proios, 2010). MOSPEQ consists of 14 items, of which 7 items represent deontological and 7 items teleological ethics definitions of moral orientation in decision making in physical education settings. In order the needs of the present study to be satisfied, the stem was modified by substituting the term *physical education* with the term *sports*. Thus, the items were prefaced with the heading, "Do I believe that my actions in sport are characterized by ...". On each item, subjects responded on a 9-point Likert-type scale from 1 (*strongly disagree*) to 9 (*strongly agree*). The alpha coefficients for the subscales deontological ethics was ($\alpha = .68$), and teleological ethics ($\alpha = .73$), indicating good reliability for each one of them.

Athletic identity. Athletic identity was measured using the Athletic Identity Measurement Scale (AIMS; Brewer & Cornelius, 2001). AIMS consists of 7 items to which individuals respond on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*). This scale comprises three subscales: social identity, exclusivity and negative affectivity. Two of the three subscales, namely *social identity* and *exclusivity* ($\alpha = .69$ and $\alpha = .75$, respectively) demonstrated acceptable internal consistencies. However, the *negative affectivity* subscale demonstrated very low ($\alpha = .25$) internal consistency and thus was excluded from the data analysis of the present study.

Achievement Goal Orientation. The participants' achievement (mastery and ego) goal orientations in sport were assessed through the Achievement Goal Scale for Youth Sports (AGSYS; Cumming, Smith, Smoll, Standage, & Grossbard, 2008). In response to the stem, "I feel sports have gone really well for me when..." participants indicated the extent to which they agreed or disagreed with each of the 12 items on a 5-point Likert-type scale ranging from 1 (*not at all true*) to 5 (*very true*). The alpha coefficient in each subscale was .70, .88, indicating good reliability of each one.

Social Goal Orientation. Three subscales from the achievement goal orientation measure by Stuntz and Weiss (2003) were used to assess reported social goal orientation towards coach praise (five items), friendship (five items) and group acceptance (four items). Participants responded to the stem and each item using a 5-point Likert-type scale (1 = *strongly disagree*, 5 = *strongly agree*). The reliability of the social orientation scale was also calculated using alpha coefficient. Alpha coefficients for the coach praise was ($\alpha = .68$), friendship ($\alpha = .84$) and group acceptance ($\alpha = .76$), indicating good reliability for each.

Results

Descriptive statistics

The sample reported relatively moderate levels of anger ($M = 3.01$, $SD = .89$). More specifically, descriptive statistics as presented in Table 1 have shown that athletes of artistic gymnastics are aware of exhibiting higher levels of anger than the athletes in the other two sports. In addition, descriptive statistics established that anger is a feeling increasing with sport division. Finally, this analysis showed that boys perceive the existence of higher levels of anger than girls.

Table 1. Descriptive Statistics for Anger.

Variables		M	SD
Gender	Boy	3.41	.91
	Girl	2.90	.86
Type of Sport	Artistic gymnastics	3.21	.88
	Rhythmic gymnastics	2.58	.83
	Acrobatic gymnastics	2.78	.69
Sport Divisions	IV	2.87	1.06
	III	3.09	.78
	II	3.15	.76
	I	3.25	.52

Differences between Type of Sport, Sport Divisions, Gender and Anger

Separate univariate analyses used the hypothesis that anger varies with type of sport, sport divisions and gender. To determine type of sport-related changes in anger, a one-way ANOVA was conducted with anger as a dependent variable and Type of Sport as an independent variable. The results indicated that there was a significant effect [$F(2, 140) = 7.65$, $p < .001$]. In addition, the effect sizes (ES) were conducted to examine the meaningfulness of the statistical findings. The results revealed that the effect sample's size was significant ($ES = .10$), something that weakens the previous result. Cohen (1988) advocated that for the social and behavioural sciences an effect size (ES) of 0.2 was considered small; 0.5 a moderate ES; and 0.8 and above a large ES. Tukey follow-up analysis indicated that anger scores for artistic gymnastics athletes were significantly higher than for rhythmic gymnasts.

To determine gender-related changes in anger, a one-way ANOVA was conducted with anger as a dependent variable and Gender as an independent variable. The results indicated that there was a significant effect [$F(1, 140) = 7.75$, $p < .01$]. In addition, the effect sizes (ES) were conducted to examine the meaningfulness of the statistical findings. The results revealed that the sample's effect size was moderate ($ES = .05$). Finally, the effect of divisions on anger scores was not significant.

Relationship between Goal Orientation, Social Goal Orientation, Moral Orientation and Athletic Identity and Anger

Separate standard regression analyses (Tabachnick & Fidell, 2001) were conducted to examine the possible moderating role of goal orientation, social goal orientation, moral orientation and athletic identity in predicting anger. In each regression analyses as predictor (independent) variables Goal Orientation, Social Goal Orientation, Moral Orientation and Athletic Identity were used for Anger (dependent variable). The results indicated a significant relationship only between the social goal orientations [$R^2 = .06$, $F(3, 136) = 2.89$, $p < .05$], accounting for 6% of the variance. The standardized beta coefficient revealed a positive

effect of social goal coach praise on anger ($\beta = .20$; $t = 2.35$, $p < .05$).

Discussion

The present study investigated the relationship between goal orientation, social goal orientation, moral orientation and athletic identity and anger. Univariate analyses were also used to determine the effect of independent variables, such as type of sport, sport divisions and gender in the shaping of anger. The results of this study partly revealed the anticipated expectations concerning the way in which anger is shaped.

More specifically, the results of the present study exhibited a significant effect of the type of sport on anger. This result is further supported by another study which, however, investigated the differences among athletes from sports with different features, such as collision, contact, and non-contact (Maxwell et al., 2009). Differences in the levels of anger, particularly among athletes of gymnastics and rhythmic gymnastics, which were established in this study, are probably due to the participants' gender in both sports. In gymnastics individuals from both genders participate, while in rhythmic only from one – namely girls. The present study established significant differences in anger levels between boys and girls, which support the above mentioned maintenance. Gender-related differences in anger have been reported in previous studies (Maxwell & Moores, 2007b; Maxwell et al., 2009). Ohbuchi et al. (2004) based on Gilligan's (1977) views on the existence of different moral criteria between men and women, as well as on the findings of other studies, claimed that women value different norms than men.

Contrary to expectations, the present study established no significant differences in anger among divisions, though the descriptive statistics data on anger scores were found to increase with division. Each division was considered to express a different level of competitiveness. On this basis, it could be argued that this result is contrary to that of another study, which established that anger varies with the level of competition (Maxwell et al., 2009). These two contradictory results might be due to the varying degree of competition among athletes investigated in both studies. However, the present result shows that the athletes of all divisions in the sports of gymnastics have the same reactions in terms of anger, in situations of frustration caused by loss of points, judges' errors or the athletes' underperformance.

In the present study, it was considered that anger, as a construct comprising cognitive processes, is related to other similar concepts such as moral development, achievement goal and athletic identity. However, the results of this study partly established the above mentioned approach. More specifically, these results established that achievement goal in sports situations, especially when it is oriented to social relationships, significantly affects the emotion of anger. This result further supports the argument of achievement motivation theory, that social approval goal plays an important role in determining success (Allen, 2008), since in the present study anger was investigated as a result of non-achievement of success.

Moreover, the results of this study established that, among the social goal orientations, the most important influence on anger came from the coach praise orientation. Coach praise-oriented individuals may define success in terms of gaining the approval of a coach (Stuntz & Weiss, 2003). Research suggests that coaches are strong sources of physical competence information during early and middle adolescence (e.g., Black & Weiss, 1992; Eccles, Wigfield, & Schiefele, 1998; Horn & Amorose, 1998; Papaioannou, Ampatzoglou, Kalogiannis, & Sagovits, 2008). Thus, we can assume that coaches can play an important role in the athletes' anger regulation by determining the perception of success.

Unlike the social goal orientations, the achievement goal orientations, moral development and athletic identity in the present study were not found to have any relationship with anger. This result is consistent with the result of the study which established that athletic identity is irrelevant to anger (Maxwell & Visek, 2009), and contrary to that of another study (Visek et al., 2010). Failure to establish any relation between anger and a set of constructs involving cognitive processes can be justified on the basis of the anticipation

that anger is a multidimensional construct comprising only cognitive appraisals, and action tendencies, somatic or physiological reactions, and a subjective “feeling” of being angry (Frijda, 1986). Another possible reason, which this result may be attributed to, is that the sport of gymnastics in Greece is amateur and only two to three games are held in a year. This shows that competition is limited as well as the situations likely to lead to the emergence of emotions such as anger.

The findings of the present study lead to the conclusion that anger is an emotion which comprises cognitive components displaying relationships with social approvals. In addition, the definition of success through coach praise has been established to be strongly related to anger. Furthermore, from the findings of this study it is concluded that anger is an emotion influenced by the type of sport and gender.

Limitations

Although such findings expand our knowledge on the emotion of anger, there are certain limitations in the present study, as well as some questions to be addressed in future research. The most obvious limitation is the exclusive use of self-report inventories. Anger is an emotion that cannot always be clearly distinguished. This causes difficulties in independent rating by others. The differences in the sports of gymnastics athletes' participation rates create another limitation. This restricts our ability to generalize the results.

Anger in the present study was investigated by means of issues which exhibit only cognitive characteristics. This prevents the full determination of anger and thus the clearer understanding of the relationship between anger and other constructs. Such relationships in this study, was investigated in sports with low competitiveness. The examination of such relationship in sports with increased competitiveness would add to the knowledge we have gained by the present study.

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