TITLE

The relationship between multidimensional competitive anxiety, cognitive threat appraisal, and coping strategies: A multi-sport study.

RUNNING HEAD

Competitive anxiety, threat appraisal, and coping

ABSTRACT

The purpose of the present study was to examine the relationship between, multidimensional competitive trait anxiety (cognitive and somatic anxiety), trait cognitive threat appraisal, and coping styles. Five-hundred and fifty male and female athletes of several individual and team sports, between the ages of 15 and 35 (*M*=19.8±4.5), completed the translated and adapted versions of the Sport Anxiety Scale (Smith, Smoll, & Schutz, 1990) and of the Brief COPE (Carver, 1997), as well as the Cognitive Appraisal Scale in Sport Competition – Threat Perception (Cruz, 1994). Pearson and Canonical correlations showed that higher levels of trait cognitive anxiety and threat appraisal were positively related to emotion-focused and avoidance coping and inversely related to problem- focused coping. Results are discussed in terms of the importance of individual differences in trait anxiety and threat appraisals, regarding athletes' coping styles.

Keywords: sport, trait anxiety, threat appraisal, coping strategies

Introduction

Anxiety has been a particularly strong focus of interest in sport psychology for nearly half a century (Grossbard, Smith, Smoll, & Cummings, 2009), receiving far more research attention than other emotions or psychological mechanisms (Woodman et al., 2009). This research attention yielded numerous theoretical models on the anxiety- performance relationship. However, gradually, former general and unidimensional models and theories of anxiety have been replaced by sport- specific and multidimensional theories and measures of anxiety (Campen & Roberts, 2001; Giacobbi & Weinberg, 2000; Ntoumanis & Jones, 1998). In recent times, numerous studies have explored competitive anxiety considering these developments. As a result, considerable advances have occurred concerning the nature and the role of competitive anxiety in sport (Woodman & Hardy, 2003). One of the major developments concerns the conviction that anxiety should be studied as an independent construct, which has been abandoned in favor of detailed analysis of anxiety as a set of independent constructs (Craft, Magyar, Becker, & Feltz, 2003).

In this field, Lazarus and Folkman's (1984) transactional model of stress emphasizes the central role of cognition and coping in the generation of emotions, offering a potentially fruitful theoretical framework for investigating anxiety in competitive settings. Specifically, this model provides a detailed description of the cognitive appraisal processes involved in stressful events, claiming that they are a critical mediator of a person's selection of coping strategies. These coping strategies have a direct impact on specific emotions such as competitive anxiety (Jones, 2003; Lazarus, 2000). In other words, evoking a particular coping strategy is not a primary reaction intended to reduce the negative effects of stress, but rather a response to cognitive appraisals of a situation or condition. In sport contexts, it is thought that potentially different appraisals are the main reason why athletes use different coping strategies to deal with different sources of stress (Kim & Duda, 2003).

Lazarus (1999, 2000) identified two types of cognitive appraisal. Primary appraisal refers to the evaluation of the significance of an event for a person's well-being. When a situation is appraised as stressful, four alternative appraisals can be made: challenge, benefit, harm/ loss, or threat. In secondary appraisals the person evaluates what might be done to cope (i.e., coping resources and options) (Lazarus & Folkman, 1984). A primary appraisal focused on the potential threat a situation poses is generally associated with anxiety (Lazarus, 1991, 1999). Additionally, similar to state-trait dimensions of anxiety, cognitive appraisals of threat can be considered in terms of state appraisals of one particular event, or in terms of dispositions or tendencies to consistently perceive events as dangerous to one's well-being (Lazarus, 1991; Skinner & Brewer, 2002, 2004). At present, the dynamics of the threat appraisal– anxiety relationship is well- established in several domains, including social, academic and sporting domains (Skinner & Brewer, 2002). Specifically in the sport context, a variety of researchers have systematically examined athletes' sources of threat and their relation to competitive anxiety (e.g., Bray, Martin, & Widmeyer, 2000; Dunn & Nielsen, 1993; Lewthwaite, 1990; Wilson & Eklund, 1998). In general, these investigations showed that athletes who consistently experience anxiety, especially cognitive anxiety (which reflects worry and negative thoughts), frequently anticipate failure and negative social evaluation; additionally, they tend to interpret these negative outcomes as significant threats to self-identity or self-esteem.

Moreover, it is increasingly accepted that coping plays an undeniably large role on successful sport participation (Crocker & Graham, 1995). Athletes who cope successfully with stressful events are likely to produce high performance quality, and to make sport a satisfying experience (Anshel, Sutarso, & Juvenville, 2009; Nicholls & Polman, 2007). Numerous taxonomies describe the various forms of coping people use in stressful situations, but a recent review by Nicholls and Polman (2007) reported that the perspective of Lazarus

(Lazarus, 1999; Lazarus & Folkman, 1984) is the most widely adopted model of coping within the sport literature. This perspective distinguishes between problem-focused and emotion-focused coping strategies. Specifically, problem-focused coping refers to cognitive and behavioral efforts aimed at identifying, solving, or minimizing the effects of a stressful relationship between the individual and the environment (i.e., a challenging, threatening or harmful situation). On the other hand, emotion focused-coping strategies are not intended to directly change the current situation, but to regulate the emotional response to a problem, or lessen emotional distress. Avoidance coping is a third dimension of coping often proposed, and is sometimes considered a form of emotion- focused coping (see Folkman & Moskowitz, 2004). This dimension represents actions whereby individuals disengage themselves from the task at hand, making efforts to escape, avoid, or distract themselves from the situation (Folkman & Moskowitz, 2004; Ntoumanis, Biddle, & Haddock, 1999). In sum, coping can include efforts (a) to solve the situation that caused stress, (b) to deal with one's emotions, or (c) to escape, avoid, or distract oneself from the situation (Bolgar, Janelle, & Giacobbi, 2008). Additionally, it should be noted that although the vast majority of investigations have addressed coping in events that occurred in the past or that are occurring in the present, recent findings have related coping with the ways people cope beforehand to prevent or eliminate the impact of potential stressors (e.g., preparing for a competition) (Folkman & Moskowitz, 2004). In any case, sport related research on coping focused on the identification and assessment of coping strategies demonstrated that, in general, athletes employ a wide range of problem-focused, emotion-focused, and avoidance coping strategies. These strategies seem to be used both in isolation and in combination, across a number of sport situations (e.g., Crocker & Graham, 1995; Gould, Finch, & Jackson, 1993; Holt & Hogg, 2002; Poczwardowski, & Conroy, 2004).

An important issue in coping research is also the extent to which coping is stable or variable from situation to situation. Supporters of the trait perspective (e.g., Carver, Scheier, & Weintraub, 1989; Miller, 1987) assume that coping can be seen as a psychological disposition that reflects an athlete's tendency to respond in a certain way across time and circumstances (i.e., the athletes' typical responses). In contrast, a process approach views coping as varying intra-individually from context to context. In this way, Lazarus and Folkman (1984) defined coping as "constantly changing cognitive and behavioral efforts to manage specific external and/ or internal demands that are appraised as taxing or exceeding the resources of the person" (p. 141). However, several authors (e.g., Anshel & Si, 2008; Bouchard, Guillemette, & Landry- Léger, 2004; Carver & Scheier, 1994; Rutherford & Endler, 1999) recognized the combined importance of both stable and situational factors. They claim that athletes' coping styles can influence their reactions in new situations, and can therefore be used to predict the selection of particular coping strategies in response to certain stressing situations. Along these lines, a number of studies has shown that coping styles have significant implications for several psychological variables, including affect (Ntoumanis & Biddle, 1998; Ntoumanis et al., 1999), and self-confidence (Cresswell & Hodge, 2004). Nevertheless, state anxiety is probably the most thoroughly studied variable in this area (e.g., Campen & Roberts, 2001; Ntoumanis & Biddle, 2000; Williams & Krane, 1992). In general, the investigations concerning the relationships between coping styles and state anxiety have shown that athletes who report more emotion-focused and avoidance coping tend to experience greater cognitive state anxiety.

On the other hand, it has also been hypothesized that stable factors such as personality characteristics or dispositions are also linked to coping preferences, predisposing people to cope in certain ways in stressful situations (Bouchard et al., 2004; Carver et al., 1989; Ferguson, 2001; Folkman & Moskowitz, 2004). On this matter, Costa, Sommerfield, and

McCrae (1996) have argued that coping behavior and personality should be seen as part of an adaptational continuum, not because they are measuring the same thing, but rather because there are structural and conceptual links between the two. Specifically concerning the relationship between trait anxiety and coping, previous research in general psychology has shown trait anxiety to be among the factors that appear to influence the use of particular coping methods (Carver et al., 1989; Endler, Kantor, & Parker, 1994). Carver et al. (1989) found that higher trait anxiety was positively associated with the use of denial, venting of emotions and behavioral disengagement (i.e., emotion- focused and avoidance coping), and negatively related to active coping. Additionally, Endler et al. (1994) showed that, in an academic examination situation, higher trait anxiety was positively related to emotion-focused coping and worse academic performance. Yet, not much research has been conducted on the relationship between trait anxiety and coping in the sport domain. One of the few exceptions was a study by Bresler and Pieper (1992), who assessed the relationship between trait anxiety and coping resources in American football players. The results showed that positive coping resources related to confidence, acceptance, and structuring were predicted by lower levels of anxiety. Furthermore, previous findings by Krohne and Hindel (1988) in an investigation of highly skilled German table tennis players indicated that avoidance coping following physical errors was associated with low trait anxiety and improved performance success. Nevertheless, in addition to the fact that Bresler and Pieper assessed coping resources (and not coping strategies), both these investigations used a unidimensional measure of anxiety, thus not distinguishing cognitive and somatic anxiety. More recently, trying to fill this gap, Giacobbi and Weinberg (2000) investigated the relationship between the subcomponents of anxiety and the coping styles of athletes. Specifically, the authors examined the coping responses of different subgroups of athletes, testing whether high or low trait cognitive and somatic anxious athletes differed in the frequency with which they used selected coping strategies.

The results showed that high trait anxious athletes, in both its cognitive and somatic components, responded to stress using different strategies, namely self-blame, and wishful thinking, than low trait anxious athletes. In addition, higher levels of cognitive anxiety were reported by athletes describing more use of denial, and higher levels of somatic anxiety were stated by athletes using more humor.

Concerning the relationship between coping style and cognitive appraisals, namely threat appraisal, researchers have focused mainly on situational appraisals, both in the non sport (e.g., Bouchard et al., 2009; Carver & Scheier, 1994; Ptacek, Smith, & Zanas, 1992; Rutherford & Endler, 1999) and in the sport domain (e.g., Anshel, Raviv, & Jamieson, 2001; Anshel & Wells, 2000; Dugdale, Eklund, & Gordon, 2002). On the whole, these investigations showed that situational threat appraisal and coping were related. However, while Ptacek et al. (1992) have found a relation between threat appraisal and emotion-focused coping in male and female college students, Carver and Scheier (1994) demonstrated that, in situations related to academic exams, threat was linked to a very wide range of coping qualities, including both problem-focused and avoidance coping. In the sport domain, Anshel and colleagues found evidences that supported the links between cognitive appraisals and coping. More concretely, their finding suggested that threat appraisal was strongly related to avoidance coping (Anshel et al. 2001), but weakly associated with approach coping (Anshel & Wells, 2000). Finally, in a rare study focused on both trait and state of cognitive appraisals, and emotions, Skinner and Brewer (2002) found a link between trait and state threat appraisal, coping expectations (i.e., confidence in one's ability to cope with or overcome a potential threat) and emotion, prior to an exam. The authors then extended these conclusions to sports, proposing that trait and state threat appraisals were associated with weak coping expectations, which in turn predicted high levels of pre-competitive anxiety (Skinner & Brewer, 2004).

In summary, previous studies seem to indicate that athletes who frequently experience anxiety, especially cognitive anxiety, may cope with stressful situations in different ways than less anxious athletes, usually using more avoidance and emotion-focused coping, and less problem- focused coping strategies. Additionally, there seems to be some evidence linking situational cognitive appraisals of threat, avoidance and emotion-focused coping. Nevertheless, as we have seen, previous studies that have explicitly addressed cognitive appraisals focused only on situational threat appraisal and not on its dispositional counterparts. In fact, even though these investigations have provided some insight on why performers respond in certain ways when operating in their environment (Hanton, Neil, & Mellalieu, 2008), we think that improving our understanding of the coping process in sport requires examining how the disposition of athletes' to evaluate stressful events as threatening is related with their coping styles. MacCrae (1992), for example, claimed that consistency in coping strategies depends partially on the extent of similarity of a person's appraisals. Additionally, these dispositions will influence athletes' psychological states, providing an important insight on the processes of cognitive appraisal and to our understanding of how they respond to stressful events (Folkman & Lazarus, 1985).

Furthermore, another question that needs to be investigated more thoroughly is the patterns of relationships between the different dimensions of trait anxiety and coping (Stoeber & Pekrun, 2004). This is especially important considering that Giacobbi and Weinberg (2000) claimed that excessive performance anxiety may be at least partially explained by the use of ineffective coping behaviors. In effect, it is a fact that the concept of coping effectiveness is not fully understood at this time (it is even considered one of the most difficult areas of coping research; Nicholls, Holt, & Polman, 2005), thus being difficult to classify a coping strategy as adaptative or maladaptative. However, Nicholls and Polman (2007) stated that "coping effectiveness in a sport setting refers to the extent to which a coping strategy, or

combination of strategies, is successful in alleviating the negative emotions caused by stress." (p. 15).

Against this background, the main aim of the present study was further investigate the relationships between anxiety, cognitive appraisals and coping dispositions. In fact, it is our opinion that, only when these variables are studied simultaneously, accounting for the interrelationships between them, can researchers optimize the efficacy of stress management programs. This is even more so true if we bear in mind the earlier mentioned fact that certain dispositional styles of coping can be used to predict emotional reactions (Carver & Scheier, 1994). If a sport psychologist is assessing an athlete's coping behaviors, knowledge about personality- related coping traits (such as trait anxiety and trait cognitive appraisals) places professionals in a better position to interpret the findings and offer advice. Such research will therefore help guide implementation of appropriate and successful coping interventions that target individual differences in the coping processes, educating athletes to enable them to cope more efficiently with performance stress. And finally, this should lead to improved performance and positive experiences of participating in competitive sport.

Specifically, we intended to gain a more detailed picture of how individual differences in the cognitive and somatic dimensions of trait anxiety and in trait threat appraisal related with athletes' coping styles. In view of the arguments presented earlier, it is hypothesized that threat appraisal and cognitive anxiety were positively associated with the use of more emotion- focused and avoidance coping strategies. Problem- focused coping strategies, on the other hand, were hypothesized to be unrelated (or negatively related) to threat appraisal and anxiety.

Method

Participants

Participants were 550 athletes (31.1% female and 68.9% male), between the ages of 15 and 35 years (M = 19.8±4.5). The average years of practice was 8.5, while the breakdown of participants by age was 73.6% seniors, and 23.1% juniors; 3.3% did not indicate his or her year. This group represented a variety of team and individual sports, as follows: handball (23.9% female; 76.1% male), track and field (59.3% female; 40.7% male), basketball (18.9% female; 81.1% male), soccer (14.1% female; 85.9% male), artistic gymnastics (35.5% female; 64.7% male), rhythmic gymnastics (100% female), field hockey (31.6% female; 68.4% male), roller hockey (31.6% female; 68.4% male), swimming (33.3% female; 66.7% male), water polo (50% female; 50% male), rowing (34.8% female; 65.2% male), tennis (50% female; 50% male), and volleyball (50.8% female; 49.2% male).

Instrumentation and Procedure

The participants were given a battery of questionnaires including a section for demographic data, the Portuguese versions of the Sport Anxiety Scale (Smith, Smoll & Schutz, 1990), the Brief COPE (Carver, 1997), as well as the Cognitive Appraisal Scale in Sport Competition – Threat Perception (Cruz & Viana, 1997). Exploratory and confirmatory factor analysis indicated that all three instruments possessed adequate and satisfactory psychometric properties (see Dias, Cruz, & Fonseca, 2009).

The Sport Anxiety Scale$_p$ (Cruz & Viana, 1997) is the Portuguese version of the Sport Anxiety Scale (Smith et al., 1990). This scale is a multidimensional measure of trait anxiety and intended to measure individual differences in cognitive and somatic anxiety experienced by athletes. It is composed of 21 items designed to reflect possible responses to competitive situations and yields a total score as well as three distinct subscale scores: (a) somatic anxiety (9 items); (b) worry (7 items); and (c) concentration disruption (5 items). For each item, respondents rate how they feel before or during a competitive situation, on a four-point scale

that ranges from (1) *Not at all* to (4) *Very much so*. Results in each subscale are obtained by adding the respective items; a total score of competitive anxiety can be obtained summing the three subscales scores.

The Cognitive Appraisal Scale in Sport Competition – Threat Perception (Cruz, 1996) was designed to assess primary cognitive appraisal, i.e., the individual's initial interpretations about what is at stake in competitive situations for the individual, and what instigates stress and anxiety. This instrument is an adaptation of similar instruments used by Lazarus and colleagues in other contexts (Lazarus & Folkman, 1984) and can be administered in a situational or dispositional format; in the present study, it was used in its dispositional version. The Cognitive Appraisal Scale is composed of eight items and, for each item, respondents rate how each statement generally applies to each of them, on a five-point scale ranging from (1) *Not at all to* (5) *Very much so*. Hence, the total score ranges from 8 to 40. Higher scores reflect the tendency to appraise the competitive situation as more threatening or containing higher levels of threat to the ego, self-esteem, or personal well-being generated by competition.

Brief $COPE_p$ (Cruz, 2003), the Portuguese version of the Brief COPE (Carver, 1997), is an abbreviated inventory of coping responses. It is composed of 28 items and yields 14 subscales with two items per scale: (a) acceptance; (b) active coping; (c) behavioral disengagement; (d) denial; (e) humor; (f) planning; (g) positive reframing; (h) religion; (i) self-blame; (j) self-distraction; (k) substance use; (l) using emotional support; (m) using instrumental support; and (n) venting. Response choices range from (1) *I didn't do this at all* to (4) *I did this a lot*. Results in each subscale are obtained adding the respective item, thus ranging from 4 to 8 in each subscale. In the present study, Brief $COPE_p$ was administered in a dispositional response format, with the intention of assessing coping style. Participants were

asked to recall how they usually responded to problematic and stressful situations in their sport experience.

Results

Table 1 presents the Pearson correlation coefficients between the different variables in this study. Concerning this analysis, it should first be noted that, following procedures adopted by Carver et al. (1989), because of the large sample size, we have elected to use a more conservative significance criterion than usual. In general, findings are not discussed unless they are significant at the .01 level. Also, no overall problems of multicollinearity emerged among the coping subscales. Specifically, with the exception of the correlation between the two subscales of support (r=.72), the intercorrelations ranged from 0 to 0.49. However, such strong correlation was predictable and can be an indicator that athletes seek emotional support not only to obtain information on the best way to overcome problems, but also to request comfort and emotional support. In earlier studies by Carver et al. (1989) and Crocker and Graham (1995) similar results were found.

In addition, there was a relatively clear and well defined positive association between trait anxiety (cognitive and somatic), threat appraisal, and several emotion- focused (e.g., denial, self- blame, venting of emotions) and/ or avoidance coping strategies (e.g., behavioral disengagement, self- distraction). Finally, whereas in general all the coping skills inter-correlated positively among themselves, regardless of being emotion- or problem- focused, active coping was the only variable negatively associated with other variables, namely concentration disruption, behavioral disengagement and substance use.

INSERT TABLE 1

Canonical correlations

A canonical correlation analysis was conducted to examine in more detail the relationship of anxiety and threat appraisal with different coping strategies. Specifically, the canonical correlation examined the multivariate relationships between cognitive anxiety (worry and concentration disruption), somatic anxiety, and threat appraisal as predictor variables, and coping strategies as criterion variables. The results of this analysis are presented in Table 2. Three significant functions emerged (χ^2 (56) = 276.03; $p < .001$, $r_{cn} = .53$ for Function 1; χ^2 (39) = 98.47, $p < .001$, $r_{cn} = .30$ for Function 2, and χ^2 (24) = 50.23; $p < .01$, $r_{cn} = .24$ for Function 3). Canonical loadings of .30 or greater were considered to be significant contributors to the multivariate relationship (Tabachnick & Fidell, 1996).

Function 1 was characterized by a high negative loading in worry, accompanied by a high negative loading in self-blame, and a lower negative loading in behavioral disengagement. In other words, worry was related to self-blaming and actions of withdrawal from the particular situation. Function 2 indicated a high negative loading in threat appraisal and a lower negative loading in worry, in conjunction with a high positive loading in the strategies of positive reframing and active coping, and a lower positive loading in venting of emotions, planning, and instrumental support. These results suggest that threat appraisal and worry were negatively related to the positive reframing of the stressful situation, active coping, planning, and instrumental support, as well as to venting of emotions. Finally, Function 3 showed a high negative loading in concentration disruption, along with negative loadings in self-distraction, behavioral disengagement, and venting, and a lower positive loading in active coping. Thus, this function corroborated positive associations of concentration disruption with self-distraction, behavioral disengagement, and venting of emotions, and a negative association with the use of active coping.

INSERT TABLE 2

Discussion

The purpose of the present study was to examine the interrelationships between anxiety, cognitive appraisals of threat, and coping strategies in the sport context. Taken as a whole, the findings of this investigation showed that individual differences in trait anxiety, especially cognitive anxiety, and threat appraisals, may be an important factor in athletes' coping styles.

In this regard, one of the most relevant results with respect to Pearson correlations concerns the fact that, despite the low to moderate correlations found between all the variables, consistent with previous studies (e.g., Carver et al., 1989), higher levels of cognitive and somatic anxiety and threat appraisal were related to emotion- focused (e.g., denial, self- blame, venting of emotions) and/ or avoidance coping strategies (e.g., behavioral disengagement, self- distraction). On the other hand, coping skills intercorrelated among themselves regardless of their "theoretical function"; this result, although somewhat surprising, is in accordance with previous research (Carver et al., 1989; Crocker & Graham, 1995). Still, it should be recognized that the correlations between some coping strategies (e.g., active coping, positive reframing, acceptance, planning, instrumental support), considered adaptive by several researchers (e.g., Carver et al, 1989; Gaudreau, Blondin, & Lapierre, 2002; Pensgaard & Roberts, 2003), was stronger than the associations between the strategies of self-blame, substance use, and denial, which have been associated with negative outcomes, such as anxiety (Ntoumanis & Biddle, 2000) and negative affect (Ntoumanis & Biddle, 1998; Ntoumanis et al., 1999). Finally, the only significant negative correlations involved active coping, which was associated with increased levels of concentration and a lower substance use (e.g., alcohol, drugs), the latter of which might be used to avoid dealing with situations

that require an effective active coping. These results suggest the logical "incompatibility" of behavioral disengagement and active coping: if an athlete deals with the stressful situation and tries to improve it or solve the problem, it seems that the need to quit and or be "removed" physically (or *vice versa*) from the situation is not necessary.

Although the analysis of the intercorrelation data constituted an indicator of the close relationships and links between dispositional anxiety, threat appraisal, and coping, the analysis of the canonical correlations allowed the refinement of some of these results, suggesting some relevant conceptual implications. First, athletes who exhibited higher levels of worry were more likely to use self- blame and withdraw from the stressful situation (behavioral disengagement). Additionally, athletes who reported higher concentration problems were more likely to employ behavioral disengagement, self-distraction and venting of emotions. Collectively, these patterns of coping behavior provide support to investigations linking cognitive anxiety and poor performance (Hardy, 1990). Athletes with high cognitive anxiety generally worry too much about their performance, which leads to perceptions of decreased situational control or low coping expectancies (Skinner & Brewer, 2002). Consequently, those athletes might engage in less direct ways of coping, in which they blame themselves excessively for their errors and internally ruminate about "what could have been and was not done", and/ or behaviorally withdraw themselves from the situation. However, this might not be the best coping option. In effect, similar to the Zeigarnik effect, which promotes an increase of memory for unfinished tasks (Sprinthall & Sprinthall, 1993), if athletes opt to withdraw from a particular task (e.g., using behavioral disengagement or engaging in distracting activities) they may be continuously assaulted by intrusive thoughts related to the unresolved stressful situation (Lazarus, 2000), becoming incapable of controlling his emotions (venting of emotions). Ultimately, this focus on possible emotional distress will prevent athletes' to engage in active coping (Ntoumanis et al., 1999).

In contrast, athletes with lower levels of worry and threat appraisal were more likely to systematically employ an active coping stance, characterized by the use of more problem-focused strategies (active coping, planning, instrumental support, positive reframing), and, curiously, venting of emotions. Regarding active coping, planning, and instrumental support, it should be noted that Ntoumanis et al. (1999) found that athletes experienced higher levels of positive affect, if and when, they tried to solve the problem. And even considering that worry and threat appraisals were also negatively linked to venting of emotions, a coping strategy that Carver et al. (1989) considered dysfunctional in most circumstances, other authors state that, when used for a short period of time, "releasing emotions" can be an adjusted and adaptive response in some contexts (Lazarus, 2000; Niederhoffer & Pennebaker, 2002). Lazarus (2000), for example, suggests that, should they have the opportunity, athletes ought to "clear their minds' of destructive forms of thought and substitute more constructive ones that could end the vicious circle of downhill performance and restore weakened or lost motivation, attention, and concentration" (p. 249). So, it may be advantageous that athletes, besides seeking advice, outlining an appropriate plan of action, or putting the situation 'in perspective', release and express their feelings and emotions. If this occurs in combination, it can even be seen as a controlled and functional release of emotions and thoughts, thus benefiting athletes' performance.

Regarding future research, the present investigation also suggests important implications. In fact, although the above results support the existence of a strong connection between some of antecedent variables of Lazarus' (1991) theoretical framework, we are convinced that understanding can be further enhanced in this area through the exploration of both trait and situational coping, an issue that still generates controversy. Indeed, even though the present study assessed coping styles, and although several researchers recently stated that at least some coping strategies remain stable throughout competition, claiming the urgency of

more research on stable coping profiles in order to promote a deeper understanding of how individuals deal with stress and anxiety (e.g., Gaudreau & Blondin, 2004; Gaudreau et al., 2002; Giacobbi & Weinberg, 2000), other researchers are more moderate. Ntoumanis and Biddle (1998), for example, defend that including both perspectives (i.e., dispositional and situational) has already proven to be the most fruitful approach in the area of coping. The authors recall that, in the past, the separation of a variable in its trait and state components has already been applied successfully in other areas (e.g., trait and state anxiety), and that this distinction may also be useful in coping research.

In this context, it would also be relevant to examine in greater detail the relationship between trait and state measures of cognitive and somatic anxiety, threat appraisal, coping behaviors and coping effectiveness. Future investigations might, for example, administer state measures at different moments during a competitive season, immediately before or after competitive events with different levels of importance or difficulty. This procedure would reduce the difficulties associated with measuring stress and anxiety, namely the problems associated with recollection of the stressful situations and also the aggregation of coping responses used in many similar situations (i.e., responses that reflect how athletes coped with diverse competitive situations instead of a specific situation), which could be considered a limitation of the present study. Additionally, considering that it is generally accepted that successful coping is related to perceptions of increased control over the situations, defined as the extent to which a person believes he or she can shape or influence a stressful person-environment relationship (Lazarus & Folkman, 1984), constructs such as self-confidence, self-efficacy expectations, and self-control constitute essential variables to be included and examined in future research.

Finally, examining the effectiveness of these strategies in both the short and long term, hence providing further insight into coping effectiveness and guiding the implementation of

appropriate and successful coping interventions (Nicholls & Polman, 2007), could be pursued by investigating the links between different coping strategies and interpretations of anxiety symptoms (Hardy, Jones, & Gould, 1996). Indeed, the argument that athletes may interpret their anxiety symptoms differently may increase our knowledge of how experiencing anxiety may help performers compete successfully in stressful situations (Hanton et al., 2008; Mellalieu, Hanton, & Fletcher, 2006). Moreover, future studies should not only explore more thoroughly the role of different sources of perceived threat in the experiences of athletes, but also take up new developments in the context of theoretical perspectives on the cognitive appraisal of stressful events. According to Skinner and Brewer (2004), it is possible that, at the level trait of styles of cognitive appraisal, an athlete might display a dual threat/ challenge appraisal style "in which he or she is high on cognitive anxiety, a construct similar to threat, but can nevertheless see sport competitions as challenging opportunities for success and other personal benefits." (p. 298). Hence, athletes with pure trait threat styles or with a dual appraisal style should not be treated identically.

From a practical point of view, and in spite of the fact that the above findings require further replication, the present investigation may have important implications regarding the use of appropriate counseling and intervention techniques in anxiety and stress management programs. Indeed, in view of the well documented detrimental consequences of high levels of anxiety on sport performance (Raglin & Hanin, 2000), it is our opinion that this information may play a crucial role in the development and implementation of specific anxiety management interventions and/ or more general psychological skills training programs. Both types of intervention should take into consideration and try to encourage active and problem-focused coping strategies, which, in the present investigation, were associated with lower levels of cognitive anxiety and threat perception. Simultaneously, the use of other coping behaviors, such as self-blame or behavioral disengagement, should be restrained. However,

considering that often the effectiveness of a strategy may depend on situational and contextual variables (Ntoumanis & Biddle, 1998), we believe athletes' education and training must also involve strategies that promote their cognitive flexibility and more adaptative cognitive appraisal processes. As Carver et al. (1989) noted coping strategies may not be intrinsically maladaptative unless they are used for long periods of time, when other strategies may be more appropriate.

References

Anshel, M. H., Raviv, S., & Jamieson, J. (2001). Cognitive appraisals and coping strategies following acute stress among skilled competitive male and female athletes. *Journal of Sport Behavior, 24*(2), 128.

Anshel, M. H., & Si, G. (2008). Coping styles following acute stress in sport among elite chinese athletes: A test of trait and transactional coping theories. *Journal of Sport Behavior*, *31*, 3-21.

Anshel, M. H., Sutarso, T., & Jubenville, C. (2009). Racial and gender differences on sources of acute stress and coping style among competitive athletes. *The Journal of Social Psychology, 149*(2), 159-177.

Anshel, M. H., & Wells, B. (2000). Sources of acute stress and coping styles in competitive sport. *Anxiety, Stress, and Coping, 13*, 1–26.

Bolgar, M. R., Janelle, C., & Giacobbi, P. R.(2008). Trait anger, appraisal and coping differences among adolescent tennis players. *Journal of Applied Sport Psychology, 20*(1), 73-87.

Bouchard, G., Guillemette, A., & Landry-Léger, N. (2004). Situational and dispositional coping: An examination of their relation to personality, cognitive appraisals, and psychological distress. *European Journal of Personality, 18*, 221-238.

Bray, S. R., Martin, K. A., & Widmeyer, W. N. (2000). The relationship between evaluative concerns and sport competition anxiety among youth skiers. *Journal of Sports Sciences, 18*, 353–361.

Bresler, S. A., & Pieper, W. A. (1992). *Competitive trait anxiety and coping resources* for stress in high school athletes. *Applied Research Quarterly Coach Athlete Annual, 7*, 163–181.

Campen, C., & Roberts, D. C. (2001). Coping strategies of runners: Perceived effectiveness and match to precompetitive anxiety. *Journal of Sport Behavior, 24*(2), 144-162.

Carver, C. S. (1997). You want to measure coping but your protocol's too long: Consider the Brief Cope. *International Journal of Behavioral Medicine, 4*(1), 92-100.

Carver, C. S., & Scheier, M. F. (1994). Situational coping and coping dispositions in a stressful transaction. *Journal of Personality and Social Psychology, 66*, 184-195.

Carver, C. S., Scheier, M. F., & Weintraub, J. K. (1989). Assessing coping strategies: A theoretically based approach. *Journal of Personality and Social Psychology, 56*, 267-283.

Costa, P. T., Somerfield, M. R., & McCrae, R. R. (1996). Personality and health. In L. Pervin (Ed.), *Handbook of personality theory and research* (pp. 44-61). London, UK: Guilford Press.

Craft, L. L., Magyar, T. M., Becker B. J., & Feltz, D.L. (2003). The relationship between the Competitive State Anxiety Inventory- 2 and sport performance: A meta-analysis. *Journal of Sport & Exercise Psychology*, *25*, 44–65.

Crocker, P. R., & Graham, T. R. (1995). Coping by competitive athletes with performance stress: Gender differences and relationships with affect. *The Sport Psychologist, 9*, 325-338.

Cresswell, S., & Hodge, K. (2001). Coping with stress in elite sport: A qualitative analysis of elite surf life saving athletes. *New Zealand Journal of Sports Medicine, 29*, 78 – 83.

Cruz, J. F. (1996). *Stress, ansiedade e rendimento da competição desportiva* [*Stress, anxiety, and performance in sport competition*]. Braga, Portugal: Centre of Research in Education and Psychology, Institute of Psychology, University of Minho.

Cruz, J. F. (2003). *Brief Cope$_{p.}$* Unpublished manuscript. Braga: University of Minho (Portugal).

Cruz, J. F., & Viana, M. F. (1997). Escala de Ansiedade do Desporto: Características e validade da adaptação portuguesa [Sport Anxiety Scale: Characteristics and validity of the Portuguese version]. In J. F. Cruz, & A. R. Gomes (Eds.), *Psicologia Aplicada ao Desporto e à Actividade Física: Teoria, Investigação e Intervenção* [*Psychology Applied to Sport and Physical Activity: Theory, Investigation and Intervention*] (pp. 349-365). Braga, Portugal: University of Minho and Portuguese Psychologists Association.

Dias, C., Cruz, J. F., & Fonseca, A. M. (2009). Anxiety and coping strategies in sport contexts: A look at the psychometric properties of Portuguese instruments for their assessment. *The Spanish Journal of Psychology, 12*(1), 338-348.

Dugdale, J. R., Eklund, R. C., & Gordon, S. (2002). Expected and unexpected stressors in major international competitive: Appraisal, coping, and performance. *The Sport Psychologist, 16*, 20-33.

Dunn, J. G., & Nielsen, A. B. (1993). A between-sport comparison of situational threat perceptions in ice hockey and soccer. *Journal of Sport & Exercise Psychology, 15*, 449-465.

Endler, N. S., Kantor, L., & Parker, J. D. A. (1994). State-trait coping, state-trait anxiety, and academic performance. *Personality and Individual Differences, 16*, 663-670.

Ferguson, E. (2001). Personality and coping traits: A joint factor analysis. *British Journal of Health Psychology, 6*(4), 311-325.

Folkman, S., & Lazarus, R. S. (1985). If it changes it must be a process: Study of emotion and coping during three stages of a college examination. *Journal of Personality and Social Psychology, 48*, 150-170.

Folkman, S., & Moskowitz, J. T. (2004). Coping: Pitfalls and promise. *Annual Review of Psychology, 55*, 745–774.

Gaudreau, P., & Blondin, J. P. (2004). Different athletes cope differently during a sport competition: A cluster analysis of coping. *Personality and Individual Differences, 36*, 1865-1877.

Gaudreau, P., Blondin, J. P., & Lapierre (2002). Athletes' coping during a competition: Relationship of coping with positive affect, negative affect, and performance-goal discrepancy. *Psychology of Sport and Exercise, 3*, 125-150.

Giacobbi, P. R., & Weinberg, R. S. (2000). An examination of coping in sport: Individual trait anxiety differences and situational consistency. *The Sport Psychologist, 14*, 42-62.

Gould, D., Finch, L. M., & Jackson, S. A. (1993). Coping strategies used by national champion figure skaters. *Research Quarterly for Exercise and Sport, 64*, 453-468.

Grossbard, J., Smith, R., Smoll, F., & Cumming, S. (2009). Competitive anxiety in young athletes: Differentiating somatic anxiety, worry, and concentration disruption. *Anxiety, Stress, and Coping, 22*(2), 153-166.

Hanton, S., Neil, R., & Mellalieu, S. (2008). Recent developments in competitive anxiety direction and competition stress research. *International Review of Sport and Exercise Psychology, 1*(1), 45-57.

Hardy, L. (1990). A catastrophe model of performance in sport. In J. G. Jones, & L. Hardy (Eds.), *Stress and performance in sport* (pp. 81-106). New York, NY: John Wiley.

Hardy, L., Jones, G., & Gould, D. (1996). *Understanding psychological preparation for sport: Theory and practice of elite performers*. Chichester, UK: Wiley.

Holt, N. L., & Hogg, J. M. (2002). Perceptions of stress and coping during preparation for the 1999 women's soccer world cup finals. *The Sport Psychologist, 16*, 251-271.

Jones, M. V. (2003). Controlling emotions in sport. *The Sport Psychologist, 17*(4), 471-486.

Kim, M., & Duda, J. L. (2003). The coping process: Cognitive appraisals of stress, coping strategies, and coping effectiveness. *The Sport Psychologist, 17*(4), 406-425.

Krohne, H. W., & Hindel, C. (1988).Trait anxiety, state and coping behavior as predictors of athletic performance. *Anxiety Research, 1*(3), 225-234.

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

Lazarus, R. S. (1999). *Stress and emotion: A new synthesis*. New York, NY: Springer.

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

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal and coping*. New York, NY: Springer.

Lewthwaite, R. (1990). Threat perception in competitive trait anxiety: The endangerment of important goals. *Journal of Sport & Exercise Psychology, 12*(3), 280–300.

McCrae, R.R. (1992). The five-factor model: Issues and applications [Special issue]. *Journal of Personality, 60*(2), 175-532.

Mellalieu, S. D., Hanton, S., & Fletcher, D., (2006). A competitive anxiety review: Recent directions in sport psychology research. In S. Hanton, & S. D. Mellalieu (Eds), *Literature reviews in sport psychology* (pp. 1-45). Hauppage, NY: Nova Science.

Miller, S. M. (1987). Monitoring and blunting: Validation of a questionnaire to assess styles of information seeking under threat. *Journal of Personality and Social Psychology, 52*, 345-353.

Nicholls, A., & Polman, R. C. J. (2007). Coping in sport: A systematic review. *Journal of Sport Sciences, 25*, 11-31.

Nicholls, A. R., Holt, N. L., & Polman, R. C. J. (2005). A phenomenological analysis of coping effectiveness in golf. *The Sport Psychologist, 19*, 111-130.

Ntoumanis, N., & Biddle, S. J. H. (1998). The relationship of coping and its perceived effectiveness to positive and negative affect in sport. *Personality and Individual Differences, 24*(6), 773-788.

Ntoumanis, N., & Biddle, S. J. H. (2000). Relationship of intensity and direction of competitive anxiety with coping strategies. *The Sport Psychologist, 14,* 360-371.

Ntoumanis, N., Biddle, S. J. H. & Haddock, G. (1999). The mediating role of coping strategies on the relationship between achievement motivation and affect in sport. *Anxiety, Stress, and Coping, 17*, 643-665.

Ntoumanis, N., & Jones, G. (1998). Interpretation of competitive trait anxiety symptoms as a function of locus of control beliefs. *International Journal of Sport Psychology, 29*, 99-114.

Niederhoffer, K. G., & Pennebaker, J. W. (2002). Sharing one's story: On the benefits of writing or talking about emotional experience. In C. R. Snyder, & S. J. Lopez (Eds.). *Handbook of positive psychology* (pp. 573-583). Oxford, UK: Oxford University Press.

Pensgaard, A. M., & Roberts, G. C. (2003). Achievement goal orientations and the use of coping strategies among winter Olympians. *Psychology of Sport and Exercise, 4*, 101-116.

Poczwardowski, A., & Conroy, D. E. (2002). Coping responses to failure and success among elite athletes and performing artists. *Journal of Applied Sport Psychology, 14*(4), 313-329.

Ptacek, J., Smith, R., & Zanas, J. (1992). Gender appraisal and coping: A longitudinal analysis. *Journal of Personality, 60*(4), 747-770.

Raglin, J. S., & Hanin, Y. (2000). Competitive anxiety. In Y. L. Hanin (Ed.), *Emotions in sport* (pp. 93-112). Champaign, IL: Human Kinetics.

Rutherford, A. & Endler, N. S. (1999). Predicting approach–avoidance: The roles of coping styles, state anxiety, and situational appraisal. *Anxiety, Stress, and Coping, 12*, 63-84.

Skinner, N., & Brewer, N. (2002). The dynamics of threat and challenge appraisals prior to stressful achievement events. *Journal of Personality and Social Psychology, 83*(3), 678-692.

Skinner, N., & Brewer, N. (2004). Adaptive approaches to competition: Challenge and positive emotion. *Journal of Sport & Exercise Psychology*, *26*, 283-305.

Smith, R. E., Smoll, F. L., & Schutz, R. W. (1990). Measurement and correlates of *sport*-specific cognitive and somatic trait anxiety: The Sport Anxiety Scale. *Anxiety Research, 2*, 263-280.

Sprinthall, N. A., & Sprinthall, R. C. (1993). *Psicologia Educacional: Uma abordagem desenvolvimentalista [Educational Psychology: A developmental perspective]* (Trans). Lisbon, Portugal: McGraw-Hill.

Stoeber, J., & Pekrun, R. (Eds.) (2004). Advances in test anxiety research [Special issue]. *Anxiety, Stress, and Coping, 17*(3), 205-211.

Tabachnick, B. G., & Fidell, L. S. (1996). *Using multivariate statistics* (3rd Ed.). New York, NY: Harper Collins.

Williams, J., & Krane, V. (1992). Coping styles and self-reported measures of state anxiety and self-confidence. *Journal of Applied Sport Psychology, 4*, 134-143.

Wilson, P., & Eklund, R. C. (1998). The relationship between competitive anxiety and self-presentational concerns. *Journal of Sport & Exercise Psychology, 20*, 81-97.

Woodman, T., & Hardy, L. (2003). The relative impact of cognitive anxiety and self-confidence upon sport performance. A meta- analysis. *Journal of Sports Sciences, 21*, 443–457.

Woodman, T., Davis, P. A., Hardy, L., Callow, N., Glasscock, I., & Yuill-Proctor, J. (2009). Emotions and sport performance: An exploration of happiness, hope, and anger. *Journal of Sport & Exercise Psychology, 31*(2), 169-188.

Table 1 – Intercorrelations between all the variables in the study

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1 - Worry	1																
2 – Concentration disruption	.57**	1															
3 – Somatic anxiety	.50**	.34**	1														
4 – Threat appraisal	.66**	.43**	.40**	1													
5 – Self-distraction	.17**	.22**	.19**	,20**	1												
6 – Active coping	-.07	-.12*	.06	.07	.14*	1											
7 – Denial	.16**	.15**	.11	.27**	.20**	.06	1										
8 – Substance use	.06	.10	.03	.08	.09	-.14*	.19**	1									
9 – Emotional support	.08	.08	.11*	.15**	.20**	.18**	.22**	.08	1								
10 –Instrumental support	.11*	.06	.13*	.21**	.20**	.30**	.16**	.02	.72**	1							
11 – Behavioral disengagement	.29**	.24**	.15**	.25**	.12*	-.18**	.24**	.23**	.08	-.00	1						
12 – Venting	.22**	.16**	.24**	.29**	.24**	.25**	.25**	.11*	.27**	.30**	.04	1					
13 – Positive reframing	-.06	-.07	.12*	.02	.18**	.38**	.09	.03	.11	.17**	-.05	.23**	1				
14 – Planning	.01	-.03	.09	.08	.12*	.43**	.09	-.00	.14*	.22**	-.10	.30**	.49**	1			
15 – Humor	-.00	.07	.02	.02	.20**	.14*	.11	.13*	.09*	.15**	-.001	.20**	.36**	.27**	1		
16 – Acceptance	-.02	-.03	.03	-.01	.14*	.28**	.00	.01	.08	.19**	-.03	.24**	.34**	.35**	.24**	1	
17 – Religion	.07	.08	.07	.18**	.13*	.23**	.18**	.11*	.23**	.25**	.01	.29**	.27**	.22**	.12*	.15**	1
18 – Self-blame	.33**	.16**	.13*	.35**	.13*	.13*	.18**	.17**	.14*	.16**	.19**	.32**	.15*	.26**	.15**	.21**	.21**

*p < .01; ** p< .001

Table 2 – Canonical loadings for trait anxiety, threat appraisal and coping strategies

	Function 1	*Function 2*	*Function 3*
Predictor variables			
Worry	-.86	-.35	-.29
Concentration disruption	-.23	-.18	-.95
Somatic anxiety	-.20	-.16	-.14
Threat appraisal	-.29	-.92	-.19
Criterion variables			
Self-distraction	.14	.15	-.65
Active coping	-.07	.62	.33
Denial	-.13	.07	-.12
Substance use	.08	-.15	-.15
Emotional support	-.01	.24	-.20
Instrumental support	-.20	.36	-.08
Behavioral disengagement	-.30	-.13	-.55
Venting of emotions	-.21	.52	-.46
Positive reframing	.11	.71	-.01
Planning	-.07	.47	-.01
Humor	.27	-.04	-.20
Acceptance	.04	.20	-.02
Religion	-.04	.16	-.03
Self-blame	-.80	-.03	-.14