Title page

Stress, Sport Confidence, and Performance of Soccer Athletes: The Mediation of Cognitive Appraisal Cognitive Appraisal

Short title: *Cognitive Appraisal in Soccer Athletes*

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Catarina Morais: Methodology, Formal analysis, Data curation, Writing – Original draft. **Clara Simães:** Conceptualization, Methodology, Formal analysis, Data curation, Writing – Review & Editing. **A.Rui Gomes:** Conceptualization, Methodology, Writing – Review & Editing, Supervision. **Beatriz M. Gonçalves:** Conceptualization, Resources.

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Stress, Sport Confidence, and Performance of Soccer Athletes: The Mediation of Cognitive Appraisal

Abstract

This study aimed to provide a framework for how athletes evaluate stress before a competition and how stress relates to cognitive appraisal, sport confidence, and expectations of performance. Participants were 327 youth male athletes, aged 15 - 19 years (M = 16.90; SD = 1.00) who competed in the [Country] National Football League. We collected data 24-48 hours before their match, using the critical incident methodology. Results revealed that most athletes identified their opponents as the main source of stress. Increases in stress about their opponents were associated with decreases in their sport confidence and their expected individual and collective performance. A mediation effect was also found in such a way that the more athletes stress about their opponents, and the more they tend to perceive the situation as threatening (and less challenging), the lower their perceptions of coping and sport confidence which, in turn, predicts lower expectations of individual and collective performance. In sum, perceiving the stressful situation as either a challenge or a threat predicts young athletes' sport confidence and, consequently, expected performance when dealing with stressful competitive situations.

[150 word version]

This study aimed to provide a framework for how athletes evaluate stress before a competition and how stress relates to cognitive appraisal, sport confidence, and expectations of performance. Participants were 327 youth male athletes, aged 15 - 19 years (M = 16.90; SD = 1.00) who competed in the [Country] National Football League and completed a questionnaire 24-48 hours before their match, using the critical

incident methodology. Results revealed that oppnents was the main source of stress for athletes, and that the more athletes stress about their opponents, and the more they tend to perceive the situation as threatening (and less challenging), the lower their perceptions of coping and sport confidence which, in turn, predicted lower expectations of individual and collective performance. In sum, perceiving the stressful situation as either a challenge or a threat predicts young athletes' sport confidence and, consequently, expected performance when dealing with stressful competitive situations.

Athletes' Stress, Sport Confidence, and Performance: The Mediating Role of Cognitive Appraisal

Youth sport is frequently presented as an opportunity for athletes to develop a healthy lifestyle and different skills (Ronkainen et al., 2020). However, this is not always the case, and sports participation can also have a negative impact on young players' development (Holt & Neely, 2011). For example, excessive pressure to win and obtain higher levels of performance can contribute to stress and athletes' negative sports experiences (Gustafsson et al., 2017; Wong et al., 2015). Stress arises due to the wide number of factors that athletes face when competing, namely the possibility of a bad performance, expectations of others, pressures from opponents, injuries, among others (Doron & Bourbousson 2017; Gustafsson, et al., 2017). The stress experience can also increase if athletes perceive their personal and social resources as insufficient to deal with the competition demands, thus leading to a perceived lack of control over the situation (Simães & Gomes, 2019). To understand how athletes adapt to competition stress, we must consider their perceptions of physical, emotional, behavioral, and cognitive stressors and what coping responses they use to manage them (cf. Tamminen et al., 2016).

In this study, we aimed to provide an understanding of how athletes perceive competitive stressors immediately before a competition, as well as how competitive stressors relates to cognitive appraisal, sport sport confidence, and expectations of performance. The patterns of relations tested in our study followed Lazarus' (1991, 1999) writings about an individual's transactional adaptation to stress and subsequent adaptations (Gomes, 2014; Jones et al., 2009; Neil et al., 2011). According to the Transactional Stress Model, stress arises when the individual perceives their resources to be insufficient to deal with the challenges of the situation (Lazarus, 1991). Therefore,

stress can be understood in terms of a discrepancy between the requirements of the situation and one's personal resources for managing them (cf. Lazarus, 1991). Specifically, when athletes perceive sports as too demanding for their personal resources, negative reactions tend to occur (Gomes, 2014).

The pivotal factor that explains positive or negative reactions to stress relates to the cognitive appraisal processes that are responsible for the interpretation and coping of stressful situations (cf. Lazarus, 1991; see also Gomes et al., 2017). According to Lazarus' transactional model (1991), cognitive appraisal encompasses two dimensions: primary cognitive appraisal (which refers to the meaning of the stressful situation to the individual wellbeing, being influenced by goals, values, and beliefs of each person), and secondary cognitive appraisal (which refers to the individual judgment regarding the acquired resources to deal with the situation). Based on the primary cognitive appraisal, athletes can perceive the situation as a threat (when they anticipate negative consequences) or as a challenge (when they anticipate positive consequences) (Lazarus, 1999). The Interactive Model of Adaptation to Stress (Gomes, 2014) reinforces the need also to consider the importance given by the individual to the situation. The adaptation process to stress only begins if the individual attributes a personal meaning to the stressful situation; otherwise, athletes will not perceive the event as potentially threatening or challenging to their wellbeing. Once they have interpreted the stressful situation, athletes initiate secondary cognitive appraisal (Lazarus, 1991, 1999), evaluating if they have the personal resources to deal with the situation (*coping perception*), as well as control over the situation (*control perception*) (Gomes et al., 2013). This phase of adaptation to stress is particularly important because previous findings have indicated that, while athletes report at least one source of stress, these

stressful stimuli do not all illicit the same reactions (cf. Kaiseler et al., 2013; Scanlan et al., 1991).

Sports literature reinforced the idea that understanding athletes' adaptation to stress entails relationships between stress, cognitive appraisal, and stress reactions (outcomes) in order to fully comprehend the psychological phenomenon associated with human functioning under demanding circumstances (e.g., Bartholomew et al., 2017; Gomes, 2014; McGreary et al., 2020). However, it is very difficult to gather the whole process of human adaptation to stress in a single study because stress adaptation involves several dimensions that occur simultaneously in dynamic situations (Gomes, 2014; Lazarus, 1999). In our study, we tried to overcome these challenges by adopting a type of critical incident methodology (Hettlage & Steinlin, 2006) in which we asked athletes to report their levels of competitive stress, cognitive appraisal, sport sport confidence, and expected performance before engaging in a match. This allowed us to observe how competitive stressors, cognitive appraisal, sport sport confidence, and expected performance relate to each other in a very realistic context. Moreover, it allowed us to test the theoretical assumptions of The Interactive Model of Adaptation to Stress, which suggests that the combination of these variables explains athletes' adaptation to competition (i.e., the realization of a match). This test of relations was done in a two-step moment of analysis, determined by theory on adaptation to stress.

The first step tested direct relations from competitive stressors and cognitive appraisal to sport sport confidence and expected performance. The order of the variables in this first step considers the literature on adaptation to stress that focused on direct relations between psychological variables involved in the way athletes appraise and cope with sports demands (see Figure 1). For example, research indicates that evaluating a stressful situation as a challenge is associated with satisfactory

performance, and evaluating it as a threat can negatively impact performance (Dixon et al., 2020; Freeman & Rees, 2009; Hase et al., 2019; McGreary et al., 2020; Skinner & Brewer, 2002). More recently, Hase and colleagues (2019) conducted a systematic review to analyze whether challenge or threat states were associated with superior performance and concluded that the performance of athletes benefit from being in a challenge state rather than a threat state. Considering these indications of literature and the conceptual background of analyzing human adaptation to stress (Arnold & Fletcher, 2012; Doron & Bourbousson, 2017; Gomes, 2014; Lazarus, 1991), we established the first hypothesis of this study.

H1. Athletes' perception of competitive stressors and athletes' processes of cognitive appraisal predict athletes' sport confidence and expected performance. Specifically, it is expected that competitive stressors are negatively related to sport confidence and expected performance; threat appraisal is negatively related to sport confidence and expected performance; and challenge perception, coping perception, and control perception are positively related to sport confidence and expected performance.

[INSERT FIGURE 1 HERE]

Although it is important to analyze the relationships between antecedent factors (many times represented by stress and coping) and consequent factors (represented by several psychological competencies and skills of athletes), it is crucial to determine the mediating role of cognitive appraisal in the way athletes adapt to stress. This analysis implicates considering the process of adaptation to demanding circumstances from an integrative perspective by considering the relations between stressors (antecedent variables), cognitive appraisal (mediating variable), and reactions to stress (consequent variables). Specifically, in the second step of data analysis, we tested the relations between competitive stressors (antecedent variables), cognitive appraisal (mediating

variable), and reactions to stress (consequent variables). Adaption to stress in competitive settings has been widely studied in the literature (e.g., Cumming et al., 2017; Hatzigeorgiadis et al., 2011), and authors seem to agree that cognitive appraisal is a pivotal variable in understanding the phenomenon (Bartholomew et al., 2017; Gomes, 2014; Martinent & Ferrand, 2015). However, less is known about *how* adaptation to stress occurs, putting together the sources of stress, the cognitive appraisal dimensions, and the potential consequences to the individual (in our case, measured by sport confidence and performance). And most important, less evidence exists about the theoretical assumption that cognitive appraisal mediates the relationship between stress (as an antecedent variable) and reactions to stress (as a consequent variable). We select as consequent variables the athletes' sport confidence and expected performance, supposing that the former represents a key facilitator of the latter, as suggested by literature (e.g., Hays et al., 2009). Sport confidence refers to athletes' degree of certainty in achieving success (Vealey, 1986), influencing the responses to sports situations (Vealey, 2009) and potential success in sports competitions (cf. Plakona et al., 2014). Previous research suggests a positive contribution of sport confidence in order to cope effectively with stress and pressure of sports competition (e.g., Gucciardi et al., 2011), leading to higher sports achievement (cf. Hays et al., 2009). However, only a very small amount of research has attempted to establish a relationship between stress, cognitive appraisal, sport confidence, and performance (e.g., van Rens et al., 2019) and, consequently, the relationship between these variables has been mostly overlooked. Considering the literature in this area, it is not only expected that athletes' sport confidence to positively influence their perceptions of performance but also that their sport confidence is influenced by how they interpret the stressful situation. In practical terms, we propose that, when facing a particularly stressful situation, athletes'

predisposition to believe that they can be successful (state of sport confidence) will also be affected by *how* they interpret that particular situation. That is, if they perceive the situation as a challenge (rather than a threat) and perceive themselves as having the necessary control and resources to cope with the situation, this would positively influence their sport confidence and, consequently, their expected performance.

Despite the impact produced by stress and cognitive appraisal on athletes' sport confidence and performance, there are scarce findings about the specific relationships between these variables, i.e., the process of adaptation to stress. Thus, in this study, it is proposed that the way athletes interpret the stressful situation in terms of competitive stressors (primary cognitive appraisal) and their perceptions to cope with it (secondary cognitive appraisal) influence their degree of certainty in their abilities to have a positive outcome (sport confidence) which, in turn, affects their perception of performance. Thus, we established Hypothesis 2 to test the mediating role of cognitive appraisal on athletes' adaptation to competitive stressors and the following relations between sport confidence and expected performance (cf. Figure 2).

H2. Cognitive appraisal mediates the relationship between perceived competitive stressors *(antecedent variable) and athletes' sport confidence and expected performance (consequent variables). Specifically, it is expected that competitive stressors are positively related to threat appraisal and negatively related to challenge perception and sport confidence; threat appraisal is negatively related to coping potential and control perception and challenge perception is positively related to coping perception and control perception; coping perception and control perception are positively related to sport confidence, and sport confidence is positively related to expected performance. And most important, we expect that this mediated model offers a better explanation of human adaptation than the direct model of Hypothesis 1.*

[INSERT FIGURE 2]

In sum, literature has established the important role of psychological factors (such as cognitive appraisal, emotions, and sport confidence) to stress adaptation in sports; however, these entities have been separately studied, which makes it very difficult to comprehend athletes' full experience of adaptation to stress (cf. Nicholls et al., 2012). The need to analyze all of these variables (stress, cognitive appraisal, sport confidence, and performance) lead us to the present study, which aims to fill the gap in the literature by providing a comprehensive framework of athletes' adaptation to stress, taking as the unit of analysis the way young athletes perceive and react to a near sports competition.

Method

Participants

The initial sample comprised 373 athletes. However, 41 were excluded due to several missing values on one or more instruments, and five participants were removed as they were identified as multivariate outliers. Thus, the final sample included 327 young soccer players, all males, competing in [country] 1st-division teams (national division) at juvenile (55%) and junior (45%) levels. Their ages ranged from 15 to 19-years old (M = 16.90; SD = 1.00), and the number of years of competition at official levels ranged from 1 to 15 years (M = 9.10; SD = 2.09). Also, 76% of the players won at least one official competition at regional or national levels.

Procedure

The study was validated by the Ethics Committee of the third author's institution. First, sports clubs were contacted via *email* or telephone to explain the study goals, and they were asked to participate in the study. Teams selected for the study were competing at the national level and were included in the final phase of championships, where only a restricted group of teams competed for the national title. Once they agreed

to be involved, the research team gathered with the club's athletes and parents (when athletes were underage) so they could be informed about the study, its aims, and the anonymity and confidentiality of data analysis. All athletes agreed to voluntarily participate in the study.

Data collection was scheduled 24h to 48h prior to a match and occurred when athletes were playing the decisive games aimed at deciding the national champions. Each data collection lasted, on average 25 minutes. Athletes fulfilled all the instruments thinking about their next game. This approach, called "critical incident methodology", allows researchers to access the affective, behavioral, and cognitive dimensions of the stressful experience (cf. Hettlage & Steinlin, 2006), which was the main purpose of our study. This methodological tool is an effective way of understanding participants' judgments, allowing them to identify and clarify feelings and meanings (cf. Sharoff, 2008) about the following competition.

Measures

Athletes completed the evaluation protocol focusing on the next competition, which would take place in the following 24 to 48 hours. Thus, instructions specifically asked athletes to give their answers by thinking about how they felt at that moment regarding the next game.

Questionnaire of Competitive Stressors in Sport (QCSS; Gomes et al., 2022). Evaluates the sources of stress in the competition, including 24 items responded on a 5-point scale (*0 = No stress at all; 4 = Very high stress*). Items are organized into six dimensions: (1) *Competitive readiness* (4 items, α = .77); (2) *Performance* (4 items, α = .80); (3) *Errors* (4 items, α = .86); (4) *Social expectations* (4 items, α = .76); (5) *Opponents* (4 items, α = .88); and (6) *Injuries* (4 items, α = .76). The confirmatory factor analysis for this study showed a good fit of this measure's structure: $\chi^2(233) =$

623.41, $p < .001$, CMIN/DF = 2.68; RMSEA = .07, 90% C.I. [.06; .07]; CFI = .917; TLI = .901. Each dimension was calculated by averaging participants' responses so that higher scores reflected higher levels of stress caused by each source.

Primary and Secondary Cognitive Appraisal Scale (PSCAS; Gomes & Teixeira, 2016). Evaluates primary and secondary cognitive appraisal and includes 15 items, answered on a 7-point Likert scale (*0 = not important at all, 6 = extremely important*). The primary cognitive appraisal includes three subscales: (1) Importance perception (3 items, $\alpha = .90$), (2) Threat perception (3 items, $\alpha = .80$), and (3) Challenge perception (3 items, $\alpha = .82$). The secondary cognitive appraisal includes two subscales: (4) Coping perception (3 items, $\alpha = .86$) and (5) Control perception (3 items, $\alpha = .79$). The confirmatory factor analysis for this study showed a good fit of this measure's structure: $\chi^2(80) = 133.80$, $p < .001$, CMIN/DF = 1.67; RMSEA = .043, 90% C.I. [.03; .06]; CFI = .957; TLI = .943. A score for each subscale is computed by averaging athletes' responses so that higher scores indicate higher levels of each dimension.

Sport confidence Inventory (SCI; Vierimaa et al., 2012). Evaluates athletes' self-confidence in sport using a 4-point scale (*1 = not at all, 4 = very* much). The final score is calculated based on the average of the items so that higher scores reflect stronger sport confidence (5 items, $\alpha = .90$). The confirmatory factor analysis for this study showed a good fit of the unidimensional structure: $\chi^2(3) = 3.70$, $p = .295$, CMIN/DF = 1.23; RMSEA = .025, 90% C.I. [.00; .09]; CFI = .999; TLI = .998.

Sport Performance Perception Questionnaire (SPPQ; Gomes et al., 2019). Evaluates athletes' perceptions of sports performance on a 5-point Likert scale (*1 = completely disagree, 5 = completely agree*). Specifically, athletes were asked about their expected performance in terms of (1) Individual performance (4 items, $\alpha = .91$) and (2) Team/Collective performance (4 items, $\alpha = .93$). The final scores are calculated

based on the average of the items of the two factors. A perception of expected sports performance score was computed by averaging participants' responses. The confirmatory factor analysis for this study showed a good fit of the bi-dimensional structure but implicated the removal of item 2: $\chi^2(17) = 35.98$, $p = .005$, CMIN/DF = 2.12; RMSEA = .055, 90% C.I. [.03; .08]; CFI = .993; TLI = .988.

Data Analysis

Path analysis using AMOS® (IBM, v.24) was conducted to test the first model (H1) and the proposed mediation model (H3). A total of 327 participants were used to test the models – this is a good sample size considering Hatcher's (1994) recommendation of a minimum of 5 participants per item (52 items x 5 = a minimum of 260 participants). In order to evaluate the model fit, chi-square statistics (χ^2), confirmatory fit index (CFI), the goodness of fit index (GFI), the root-mean-square error of approximation (RMSEA), and the standardized root-mean-square residual (SRMR) were used. CFI and GFI values of .95 and .90, and SRMR values of .05 and .10 are considered good and adequate fits, respectively (Hu & Bentler, 1999, Marôco, 2014). The comparison between the proposed and the alternative models were tested using a chi-square difference test, as well as the Akaike Information Criteria (AIC) and the Bayesian Information Criteria (BIC), and Browne-Cudeck Criterion (BCC) with smaller values indicating a better fit.

Results

Descriptive Statistics and Preliminary analysis

Descriptive statistics and correlations among all variables of the study are displayed in Table 1. As expected, all competitive stressors are correlated amongst each other, and only the dimension "opponents" is correlated with expectations of individual

and collective performance. On the other hand, all dimensions of cognitive appraisal are correlated with athletes' perceptions of sport confidence and expected performance.

The data did not present severe deviations from normal distribution ($|0.01| > sk < |1.10|$, $|0.18| > ku < |1.15|$; Kline, 2011). The importance perception of PSCAS was used to check if all participants attributed at least some importance to the next game, using the typical cut-off of less or equal to two points on the Likert scale to remove participants from the database (Gomes et al., 2017). According to the cut-off used, no participants were removed. Regarding multicollinearity assumptions, no indications of multicollinearity were found based on correlations and VIF coefficients ($.001 > r < .703$; $1.01 > \text{VIF} < 2.67$).

[INSERT TABLE 1]

Prediction of Sport confidence and Expected Performance

Hypothesis 1 stated that competitive stressors and threat appraisal are negatively related to sport confidence and expected performance, whilst challenge perception, coping perception, and control perception are positively related to those variables. The path analysis showed that the model did not present an adequate fit to the data: $\chi^2(26) = 159.30$, $p < .001$; CFI = .917, PCFI = .306; GFI = .935, PGFI = .267; RMSEA = .125 (90% C.I. [.107; .144], $p_{close} < .001$); SRMR = .091; AIC = 289.30, BCC = 295.13, BIC = 535.65. Thus, Hypothesis 1 was partially confimed. Nonetheless, a closer look at the regression weights (cf. Table 2) showed that opponents are an important source of stress and that they negatively predict athletes' sport confidence and expected individual performance. Also important, challenge perceptions positively predicted sport confidence (marginally significant) and expected performance (individual and collective). More positive perceptions of control and coping perceptions also predicted higher sport confidence in expected individual performance.

[INSERT TABLE 2 HERE]

Mediation of Cognitive Appraisal

Hypothesis 2 stated that cognitive appraisal mediates the relationship between perceived competitive stressors (antecedent variable) and athletes' sport confidence and expected performance (consequent variables). Path analysis was used to test this hypothesis. The results showed an adequate fit of the proposed model to the data, $\chi^2(34) = 118.30$, $p < .001$; CFI = .948, PCFI = .413; GFI = .949, PGFI = .355; RMSEA = .087 (90% C.I. [.070; .105], $p_{close} < .001$); SRMR = .060; AIC = 232.30; BCC = 237.342. The model explained 11% of the variance of threat perception, 2% of challenge perception, 5% of perception of control, 16% of coping perception, 32% of sport confidence, 32% of expected individual performance, and 15% of expected collective performance. All direct and indirect effects are displayed in Supplementary Material 1.

The results (cf. Figure 3) showed that the increases in athletes' stress about their opponents corresponded to decreases in sport confidence and lower expectations of individual and collective performance. Also, the relationship between opponents and expectations of individual and collective performance was mediated by threat perception, coping perception, and sport confidence. Specifically, the increase of stress about opponents was positively related to perceiving the situation as a threat and as having less coping perception and sport confidence, leading to lower expectations of individual and collective performance. Moreover, the influence of opponents on expected individual performance was mediated by challenge perception, coping perception, and sport confidence. Specifically, the higher the stress about opponents, the less they perceive the situation as a challenge, and the lower the perceptions regarding coping perception and sport confidence, leading to a lower expectation of individual performance. Thus, H2 was supported in what concerns the stress related to opponents.

[INSERT FIGURE 3]

The proposed model (H2) was compared against alternative models, namely the direct model postulated on H1 and the total mediation model. Table 3 summarizes the results. A chi-square test shows that there are statistically significant differences between the proposed model (H2) and the direct model (H1): $\Delta\chi^2(8) = 41.00$, $p < .001$, but there are no statistically significant differences between the proposed model and the total mediation model: $\Delta\chi^2(6) = 8.55$, $p = .201$. Nevertheless, even though the AIC and BIC values of the proposed model are higher than the ones from the total mediation model, the proposed model is more parsimonious and presents higher values of CFI and GFI and better SRMR values. Therefore, it can be concluded that the proposed model assumed the best fit for the data.

[INSERT TABLE 3]

Discussion

Understanding adaptation to stress within contexts in which individuals have to successfully respond to highly demanding tasks, such as sports, is crucial to avoid negative effects resulting from stress, particularly when working with young athletes. This study aimed to provide a framework for how athletes evaluate different competitive stressors before the competition and, more specifically, how they interpret those stressors (cognitive appraisal) and how it relates to sport confidence and their expectations of performance. Specifically, it was expected that athletes' competitive stressors relates to cognitive appraisal and, more important, that athletes' cognitive appraisal mediates their sport confidence and, consequently, their expected individual and collective performance. The first important result refers to the fact that opponents emerged as the main competitive stressor for athletes when evaluating their experience prior to a sports competition. Moreover, the more athletes were concerned about their

opponents, the more threatening they perceived the situation to be, and the less they felt to possess the necessary coping strategies to deal with the situation, which affected their sport confidence and, in turn, their expected individual and collective performance; these results partially confirmed H1.

When it comes to youth sports, opponents would be, ideally, the least important source of stress. However, young athletes from our sample give a particular relevance to opponents 24 to 48 hours before a game. Specifically, the results indicated that stressing about the opponents is related to cognitive appraisal (higher threat and lower challenge), lower sport confidence, and lower perceived individual and collective performance. Indeed, this study revealed that opponents were a crucial and an inherent part of athletes' competitive experience, as suggested by other research (e.g., Mellalieu et al., 2009). Quite interesting was the fact that only opponents emerged as a source of stress in the mediation model. This can be explained by the methodological approach used in the study (critical incident), as athletes were asked to complete the measures 24h to 48h prior to a game. In this time frame, opponents are assumed to be a crucial aspect of athletes' preparation for the game and, therefore, may have been particularly salient, undermining the remaining possible sources of stress.

The results also indicate that athletes' cognitive appraisal of the stressful situation, as either a challenge (positive) or a threat (negative), relates to their perceived performance (H2). Previous research has already established that negative patterns of cognitive appraisal have a debilitating effect on athletes' expected performance, while positive patterns are related to increases in expected performance (e.g., Dixon et al., 2020; Hase et al., 2019). In sum, and according to H2, by evaluating a situation as a challenge, athletes can face the source of stress as a positive force, which contributes to a beneficial emotional orientation towards the situation, increasing their self-confidence

in sport, meaning that they believe that the outcome of the interaction with the stressor will be favorable (cf. Palmwood & McBride, 2017), which explains the higher expectations related to their performance.

The topic of adaptation to stress related to sports competitions is not new, and neither is the pivotal role played by cognitive appraisal (e.g., Bartholomew et al., 2017; Cumming et al., 2017; Gomes, 2014). However, little empirical evidence has focused on the mediating role of cognitive appraisal between antecedent and consequent variables of stress. Our study extends previous literature by considering this mediating role but by also including sport confidence, which has been established as a facilitator of performance and success in sport (e.g., Hays et al., 2009; Plakona et al., 2014), as well as a contributor to coping with stress and pressure in sport settings (cf. Gucciardi et al., 2011). Our study also provides a step forward by showing that the relationship between competitive stressors, cognitive appraisal, and performance is fully mediated by athletes' sport confidence. In other words, the more athletes perceive the source of stress as a challenge, the more they feel they have the personal resources to deal with the stressful situation; these positive perceptions, in turn, increase athletes' sport confidence in their ability to be successful, influencing their expectations of individual and collective performance.

Taking together, the results highlight (1) the importance of focusing on *how* athletes interpret competitive stressors instead of focusing on the stressors themselves; (2) athletes' interpretation of stressors (cognitive appraisal) influences their expectations of success (performance) via self-confidence, which can be argued to be increased when athletes perceive they have the necessary resources to cope with the stressful situation. Therefore, these results have important practical implications.

Practical Implications, Limitations, and Future Research

Results of our study not only provide support to the literature related to human adaptation to stress (e.g., Goh et al., 2010; Gomes et al., 2017; Lazarus, 1999) but also have important implications for coaches and sports psychologists working with young athletes. In fact, questioning and restructuring cognitive appraisal of competition may be an effective tool to help athletes identify and use alternative and more adaptive thoughts when facing a critical and stressful situation (Simães & Gomes, 2019). It would also be important to look at different contexts and athletes, testing if the same patterns arise with female athletes and with other sports. More importantly, the critical incident methodology appeared as an important strategy to analyze how athletes perceive competition and the related stressor factors. In fact, this approach can be used in order to collect data during the sports season because we can expect fluctuations in psychological factors when athletes are confronted with multiple demands throughout their sports career.

Declaration of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Table 1

Means, Standard Deviations, and Correlations Among all Variables (*n* = 373).

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
Competive stressors													
1. C. readiness	1.94(0.80)												
2. Performance	.644**	2.33(0.75)											
3. Errors	.662**	.703**	2.25(0.85)										
4. Social expect.	.615**	.582**	.645**	1.84(0.89)									
5. Opponents	.447**	.307**	.432**	.613**	1.05(0.79)								
6. Injuries	.630**	.544**	.521**	.473**	.337**	1.70(0.84)							
Cognitive appraisal													
7. Threat	.209**	.156**	.245**	.257**	.316**	.194**	1.35(1.30)						
8. Challenge	.080	.122*	.118*	.021	.005	.027	-.107*	4.88(1.22)					
9. Coping	-.109*	.064	-.133*	-.184**	-.253**	-.105*	-.264**	.286**	5.08(0.83)				
10. Control	-.128*	-.018	-.109*	-.112*	-.022	-.091	-.046	.150**	.420**	4.07(1.10)			
ICD													
11. Sport confi.	-.122*	.027	-.109*	-.136**	-.219**	-.109*	-.209**	.232**	.484**	.263**	3.45(0.55)		
Expectations of performance													
12. Individual	-.031	.055	-.047	-.093	-.188**	.003	-.136*	.254**	.397**	.263**	.595**	3.93(0.82)	
13. Collective	-.021	.021	.001	-.053	-.127*	.020	-.130*	.239**	.222**	.120*	.423**	.526**	4.09(0.85)

Note: *$p < .05$; ** $p < .01$

Table 2

Regression Weights for the Direct Model

	b	**SE**	**β**	***p***
Competitive stressors -> Perceived sport confidence				
Competitive readiness	-0.04	0.05	-.06	.426
Performance	0.02	0.05	.04	.631
Errors	0.02	0.04	.03	.663
Social expectations	< 0.01	0.04	-.01	.993
Opponents	**-0.08**	**0.04**	**-.11**	**.043**
Injuries	-0.01	0.04	-.01	.944
Competitive stressors -> Expectations of individual performance				
Competitive readiness	0.05	0.07	.05	.518
Performance	-0.04	0.08	-.04	.562
Errors	0.03	0.07	.03	.682
Social expectations	0.01	0.07	.01	.907
Opponents	**-0.16**	**0.06**	**-.17**	**.007**
Injuries	0.09	0.06	.10	.116
Competitive stressors -> Expectations of collective performance				
Competitive readiness	-0.04	0.09	-.04	.680
Performance	-0.01	0.09	-.01	.959
Errors	0.19	0.08	.10	.246
Social expectations	-0.04	0.08	-.04	.659
Opponents	-0.09	0.07	-.08	.236
Injuries	0.09	0.06	.10	.177
Cognitive appraisal -> Perceived sport confidence				
Threat perception	-0.02	0.02	-.04	.448
Challenge perception	**0.04**	**0.02**	**.09**	**.074**
Coping perception	**0.29**	**0.04**	**.45**	**<.001**
Perception of control	**0.05**	**0.02**	**.10**	**.043**
Cognitive appraisal -> Expectations of individual performance				
Threat perception	0.03	0.03	.05	.289
Challenge perception	**0.10**	**0.04**	**.13**	**.008**
Coping perception	**0.39**	**0.06**	**.40**	**<.001**
Perception of control	**0.11**	**0.04**	**.15**	**.003**
Cognitive appraisal -> Expectations of collective performance				
Threat perception	-0.04	0.04	-.07	.252
Challenge perception	**0.15**	**0.04**	**.20**	**<.001**
Coping perception	0.09	0.07	.09	.188
Perception of control	0.02	0.04	.02	.686

Table 3

Model Fit Parameters for the Proposed and Alternative Models

	Direct model (H1)	**Proposed model (partial mediation model; H2)**	**Total mediation model**
$\chi^2(df)$	159.30(26)	118.30(34)	126.85(40)
p	<.001	<.001	<.001
χ^2/df	6.13	3.48	3.17
RMSEA	0.13	0.87	.082
p-close	<.001	<.001	.001
SRMR	.091	.060	.068
CFI	.917	.948	.946
GFI	.935	.949	.946
AIC	289.30	232.30	228.85
BCC	295.13	237.42	233.42
BIC	535.65	448.33	422.14

Note: chi-square statistics (χ^2); root-mean-square error of approximation (RMSEA); standardized root-mean-square residual (SRMR); confirmatory fit index (CFI); goodness of fit index (GFI); Akaike Information Criteria (AIC); Browne-Cudeck criterion (BCC); and Bayesian Information Criteria (BIC).

Figure 1

The Direct Model (H1)

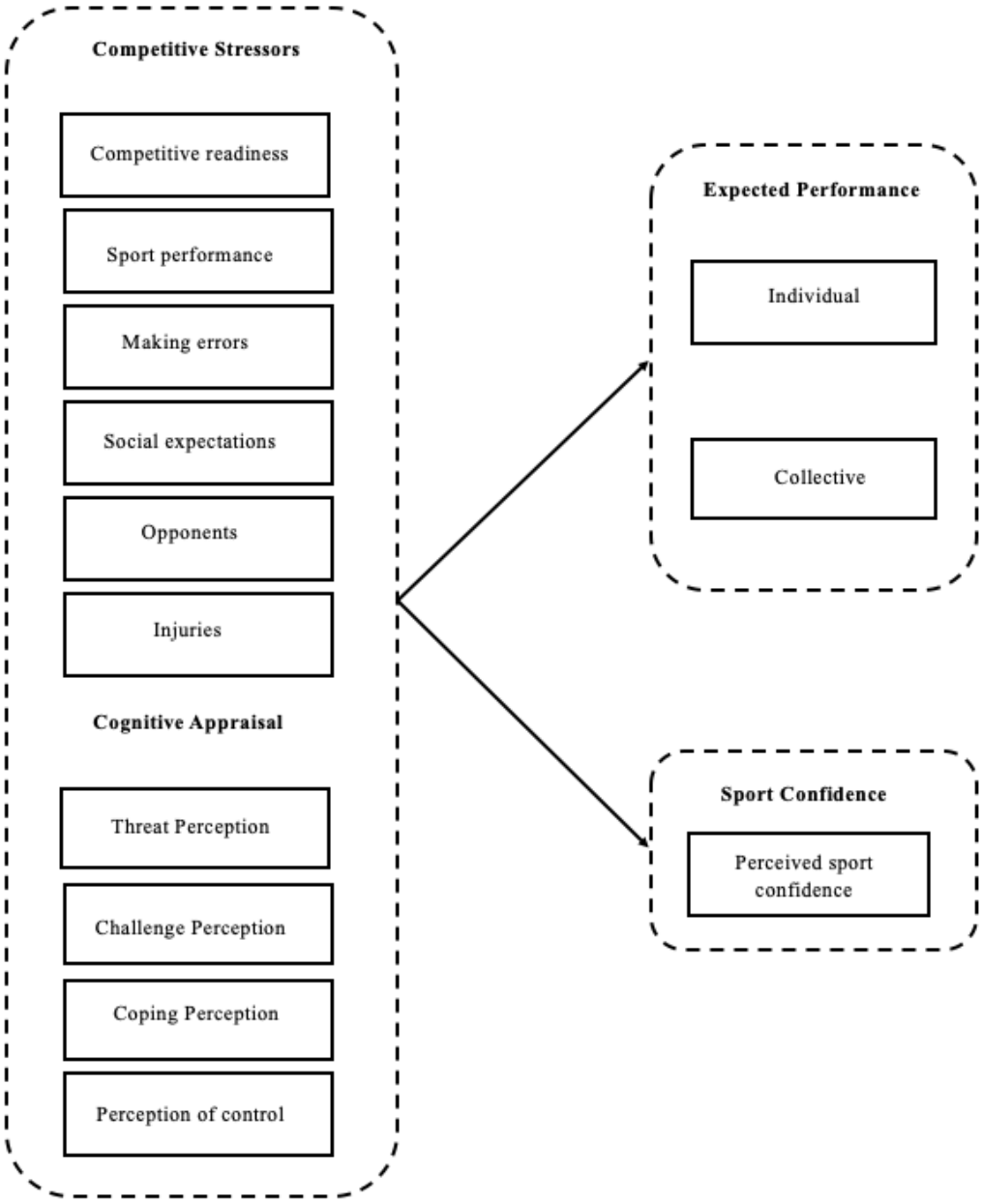


Figure 2

The Mediation Model (H2)

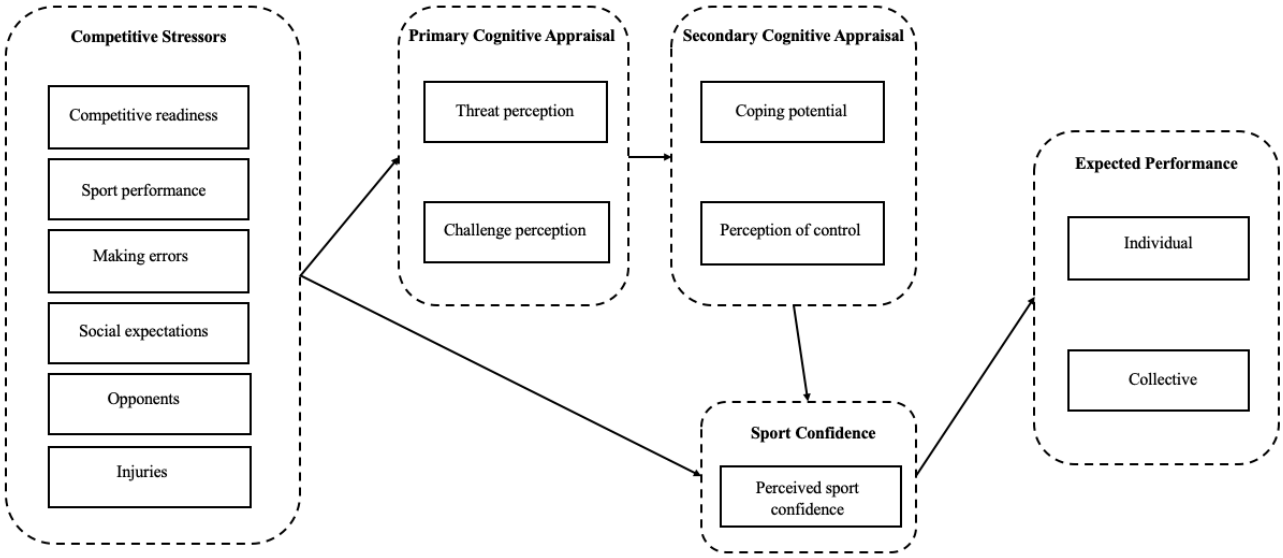
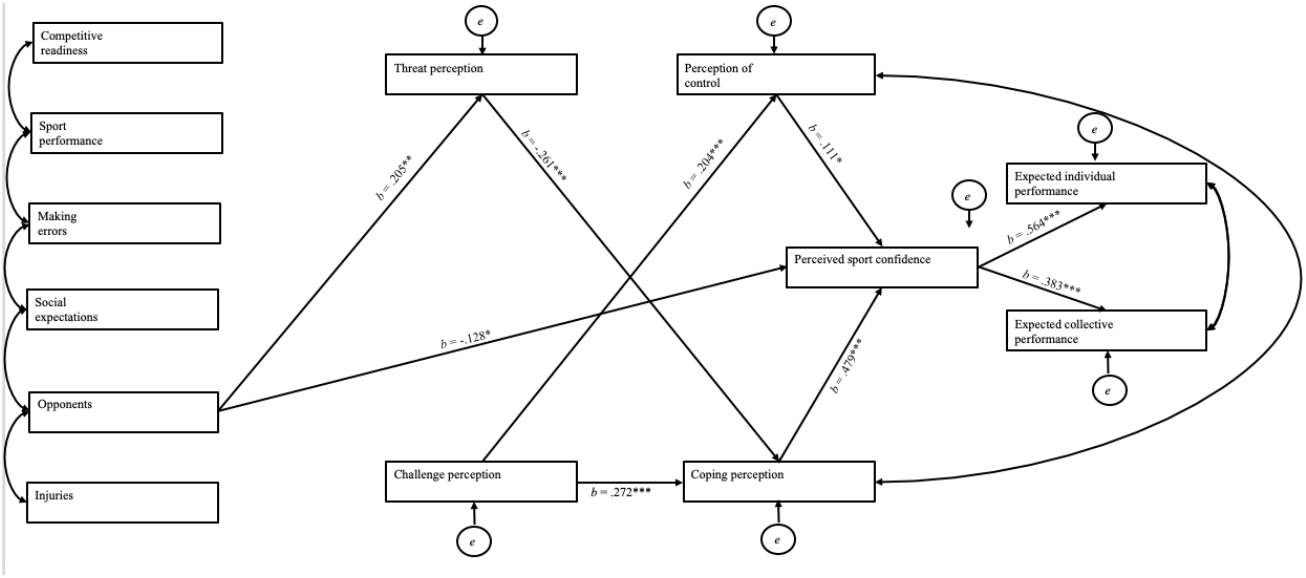


Figure 3

Path Analysis for the Mediation Model (H2; n = 327)



Note: Rectangles represent observed variables, arrows the significant direct paths, dash arrows refer to marginally significant direct paths, and *e* represents the measurement error. The six competitive stressors were correlated with each other. Note: * p < .05, ** p < .01, *** p < .001. All direct and indirect effects can be found in Supplementary Material 1.