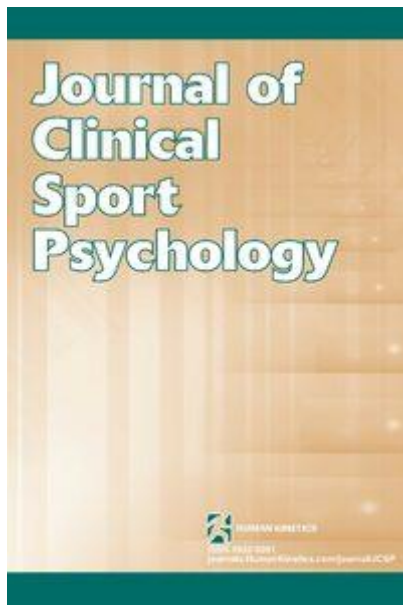


**Citar este trabalho**

Morais, C., Simões, C., Gomes, A.R, & Gonçalves, B.M. (2025). Stressors and expected performance of soccer athletes: The role of sport confidence and cognitive appraisal. *Journal of Clinical Sport Psychology*, 19(1), 1-21. <https://doi.org/10.1123/jcsp.2022-0046>.

Stressors and expected performance of soccer athletes: The role of sport confidence and cognitive appraisal

Short title: *Cognitive Appraisal in Soccer Athletes*

Authors

1. Catarina Morais (corresponding author)

Research Centre for Human Development, Faculty of Education and Psychology, Universidade Católica Portuguesa. Porto, Portugal.

ctmorais@ucp.pt

<https://orcid.org/0000-0002-9881-3514>

2. Clara Simões

3. Clara Simões

Health Sciences Research Unit: Nursing (UICISA: E), Nursing School of Coimbra (ESENFC). Coimbra, Portugal.

csimaes@ese.uminho.pt

<https://orcid.org/0000-0001-9856-2295>

3. A. Rui Gomes

Psychology Research Centre. School of Psychology. University of Minho. Braga. Portugal.

rgomes@psi.uminho.pt

<https://orcid.org/0000-0002-6390-9866>

4. Beatriz Martins Gonçalves

Psychology Research Centre. School of Psychology. University of Minho. Braga. Portugal.

a70648@alunos.uminho.pt

Funding

This study was conducted at two different research centres: Research Centre for Human Development (supported by the Foundation for Science and Technology, ref. UIDB/04872/2020) and by the Psychology Research Centre (CIPsi/UM) School of Psychology, University of Minho (supported by the Foundation for Science and Technology, ref. UIDB/01662/2020).

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 Portuguese National Football League and completed a questionnaire 24–48 hours before their match, using the critical incident methodology. Results revealed that opponents were the main source of stress for athletes and that the more athletes stress about their opponents, 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.

Keywords: Challenge perception; Threat perception; Control perception; Coping perception; Football; Stress.

Stressors and expected performance of soccer athletes: The role of sport confidence and 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 athletes' negative sports experiences (Gustafsson et al., 2017; Wong et al., 2015). These negative experiences may arise 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 (Simões & 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 confidence, and expectations of performance. The patterns of relations tested in our study followed Lazarus' (1991, 1999) transactional stress model which assumes that stress arises when individuals perceive their resources to be insufficient to deal with the demands of the situation (Lazarus, 1991). Therefore, stress should be understood as an appraisal process resulting from 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 indicates how the person evaluate the transactions with the environment, resulting in 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

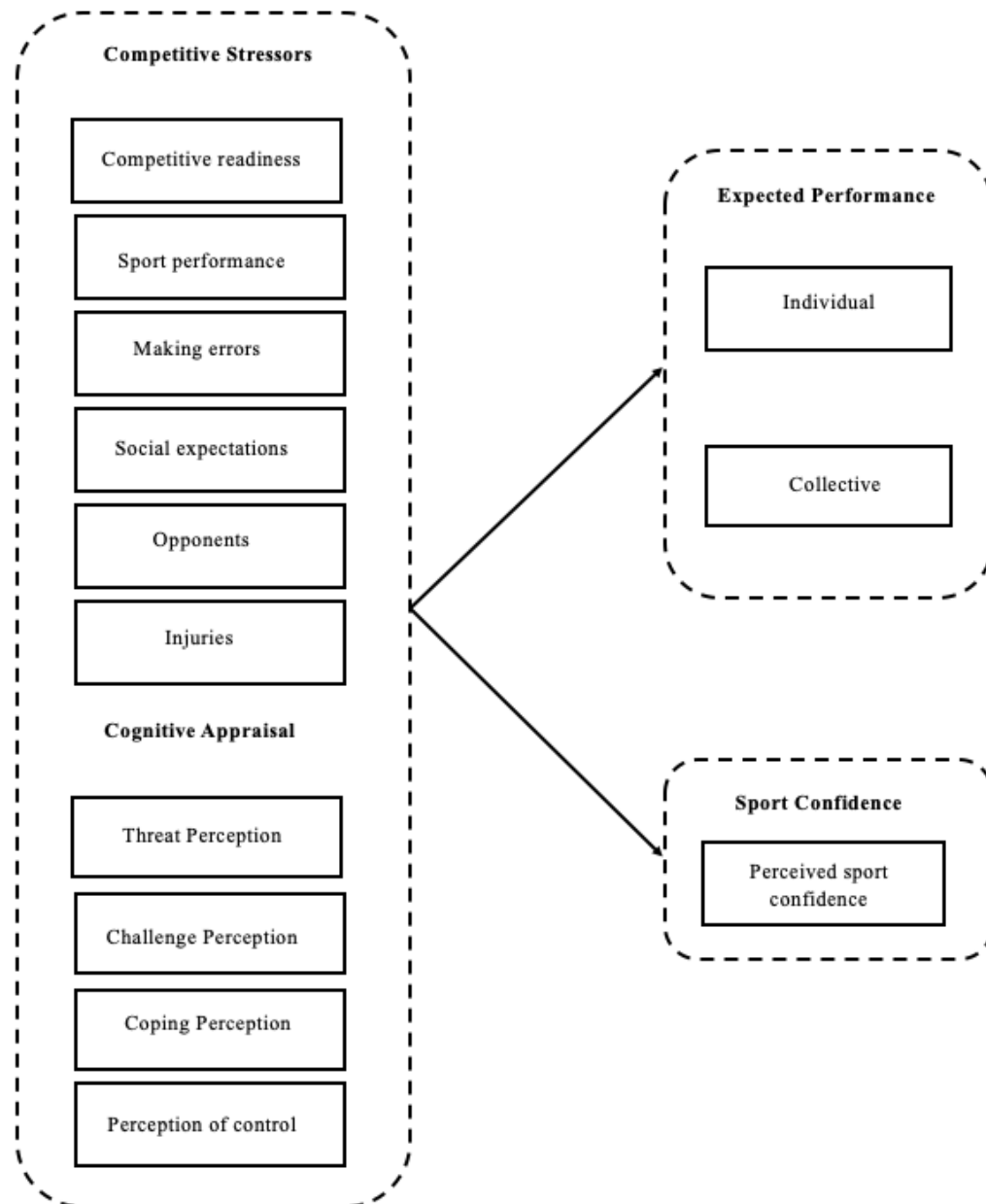
cognitive appraisal (which refers to the individual judgment regarding the acquired resources to deal with the situation). Primary cognitive appraisal can assume three forms: irrelevant appraisals (situations are not considered threatening or harmful nor has having any benefit to the individual); benign-positive appraisals (situations are considered to enhance well-being of the individual), and stressful appraisals (situations are considered to have a significant threat to the individual's well-being). The situations that are evaluated as stressful generally results in three forms of primary appraisal: threat (i.e., individuals anticipate difficult demands and negative consequences that has not yet taken place but may be imminent); harm (i.e., individuals are already experiencing psychological damage), and challenge (i.e., individuals face difficult demands but they feel confident due to the possibility of effectively mobilizing and deploying coping resources) (Lazarus, 1993). Secondary cognitive appraisal relates to the individual evaluation of what can be done to cope with the stressful situation (focusing in solving the problem or focusing in managing the emotions) (Lazarus, 1991, 1999). In sum, the transactional model proposes that adaptation to stress depends of primary cognitive appraisal (threat and challenge perceptions are central components) and secondary cognitive appraisal (coping is a central component). The interactive model of adaptation to stress (Gomes, 2014) follows the same line of reasoning as Lazarus' framework, by proposing three types of primary cognitive appraisal: (a) importance perception (indicates if the person evaluates the stressful event as significant and relevant for the personal well-being); (b) threat perception (indicates if the person evaluates the stressful event as disturbing and negative for the personal well-being); and (c) challenge perception (indicates if the person evaluates the stressful event as stimulating and exciting for the personal well-being); and two types of secondary cognitive appraisal: (d) coping perception (indicates if the person evaluates to possess personal resources to cope with the demands of the stressful event); and (e) control perception (indicates if the person evaluates to possess control over the processes of decision making of the work activity). In sum, the interactive model proposes that adaptation to stress depends of primary cognitive appraisal (importance, threat, and challenge perceptions are central components) and secondary cognitive appraisal (coping and control are the central components). Both models served as background for this study, namely the concepts of primary and secondary appraisals. The interactive model was helpful in this study because it sustained that the interaction between person and events starts with importance perception and this concept should be used as "cut-off" criteria to study this phenomenon.

Specifically, Gomes (2014) argues that the adaptation to stress process only begins if the individual attributes a personal meaning to the stressful situation. Adding this assumption means that if athletes do not evaluate the situation as important, they will not perceive neither the situation as stressful nor as potentially threatening or challenging to their wellbeing. This phase of adaptation to stress is particularly important because previous findings have indicated that the same stressor can illicit different reactions (cf. Kaiseler et al., 2013; Scanlan et al., 1991), suggesting important individual differences concerning cognitive appraisal. Also important, secondary cognitive appraisal from the interactive model allows not “only” to evaluate coping resources (as proposed in the transactional model) but also allows to evaluate the control of the individual over the stressful event. Nevertheless, this study relies on the assumption that adaptation to stress depends fundamentally of processes of cognitive appraisal.

Sports literature has highlighted that in order to fully understand athletes' psychological adaptation to a stressful situation (e.g., competition), it is important to consider not only the relationship between the stressors and the consequent reactions (outcomes), but also how athletes interpret the situation and their resources to deal with it (i.e., their cognitive appraisal) (e.g., Bartholomew et al., 2017; Gomes, 2014; McGreary et al., 2020). As stated by Tenenbaum et al. (2015), athletes' adaptation is a function of the difference of how they evaluate a specific task (e.g., challenging, threatening) and how they interpret and evaluate their ability/capacity to cope with the demands (see also Samuel et al., 2023). 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), making it very difficult for a single study to capture the different dimensions. 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 confidence, and expected performance before engaging in a match. This allowed us to observe how competitive stressors, cognitive appraisal, 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 two different phases (and, consequently, two different models), determined by theory on adaptation to stress.

The first model tested direct relations from competitive stressors and cognitive appraisal to sport confidence and expected performance. The order of the variables in this direct model 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). Specifically, 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; McCreary 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.

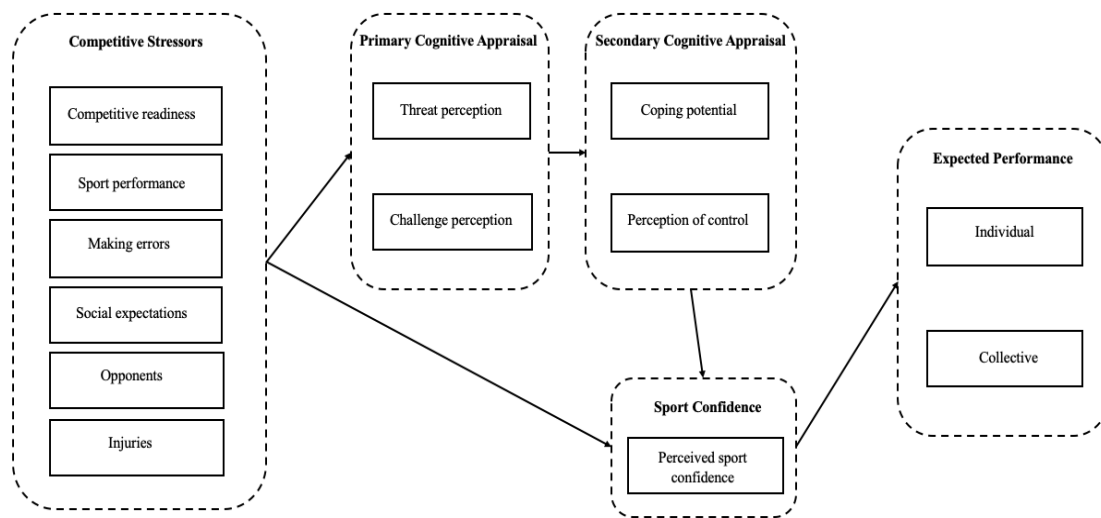
Figure 1*The Direct Model (H1)*

Although it is important to analyze the relationships between antecedent factors (many times represented by stress and coping) and consequent factors (which can include mental skills – such as self-confidence, but also expectations of performance), 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 competitive 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 competitive stressor, 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 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.

Figure 2*The Mediation Model (H2)*

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 studied separately, which makes it very difficult to comprehend athletes' whole process of adaptation to stress (cf. Nicholls et al., 2012). This study is an attempt to fill this gap, by providing a comprehensive framework of athletes' adaptation to stress, testing simultaneously antecedent factors of stress, athletes' interpretation of such factors and its consequences. Specifically, the study looks into how young athletes perceive, anticipate and react to a stressful situation (competition) in the immediate hours before it occurs, analyzing competitive stressors, athletes' interpretation (cognitive appraisal), their sport confidence and expected performance.

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 Portuguese 1st-division teams (national division) at juvenile (55%) and junior (45%) levels. Their ages ranged from 15 to 19-years old (*M*

= 16.90; $SD = 1.00$)¹, 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 approved 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. Only players who were eligible to play (e.g., not injured) and were chosen by the coach for the squad in that game were asked to participate. 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). 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, which was the main purpose of our study.

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). Athletes were asked to evaluate the sources of stress in that competition on a 5-point

¹ In Portugal, teams playing U19 and under are considered "youth football". The sample of our study included less than 6% of athletes who are aged 19. This classification as "youth" is consistent with UEFA regulations (cf. Regulations of the UEFA Youth League), in which athletes are considered eligible until the age of 18 years-old, and teams can have up to 12% of players with 19 years-old.

scale (0 = *No stress at all*; 4 = *Very high stress*). Twenty-four items are organized into six dimensions: (1) *Competitive readiness* (4 items, “Fell that I have not trained enough for the competition”; $\alpha = .77$ for this study); (2) *Performance* (4 items, “Lose or not achieve the expected result”; $\alpha = .80$ for this study); (3) *Errors* (4 items, “Make a wrong decision when I could not fail”; $\alpha = .86$ for this study); (4) *Social expectations* (4 items, “Not correspond to other’s expectations about my performance”; $\alpha = .76$ for this study); (5) *Opponents* (4 items, “Compete against an opponent that can beat me”; $\alpha = .88$ for this study); and (6) *Injuries* (4 items, “Suffer a serious injury”; $\alpha = .76$ for this study). The confirmatory factor analysis for this study showed a good fit of this measure’s structure to the data: $\chi^2(233) = 623.41, p < .001$; $RMSEA = .07$, 90% C.I. [.06; .07]; $CFI = .917$; $TLI = .901$. A score for each dimension was calculated by averaging the items’ responses. Therefore, 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. The primary cognitive appraisal includes three subscales: (1) Importance perception (3 items, “This competition... 0 = *Means nothing to me*; 6 = *Means a lot to me*”; $\alpha = .90$ for this study), (2) Threat perception (3 items, “This competition... 0 = *Is not threatening to me*; 6 = *Is very threatening to me*”; $\alpha = .80$ for this study), and (3) Challenge perception (3 items, “This competition... 0 = *Is not challenging to me*; 6 = *Is very challenging to me*”; $\alpha = .82$ for this study). The secondary cognitive appraisal includes two subscales: (4) Coping perception (3 items, “To what extent do you think you are able to deal and solve the demands of the next competition?”; 0 = *Not able at all*; 6 = *Very able*; $\alpha = .86$ for this study) and (5) Control perception (3 items, “To what extent do you feel that you control what should be done in the next competition”; 0 = *Low control*; 6 = *High control*; $\alpha = .79$ for this study). The confirmatory factor analysis for this study showed a good fit of this measure's structure to the data: $\chi^2(80) = 133.80, p < .001$; $RMSEA = .043$, 90% C.I. [.03; .06]; $CFI = .957$; $TLI = .943$. A score for each subscale was computed by averaging athletes' item 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 was calculated based on the average of the items so that higher scores reflect stronger sport confidence (5 items, “I’m confident I can meet the challenge”; $\alpha = .90$ for this study). The confirmatory factor analysis for this study showed a good fit of the

unidimensional structure to the data: $\chi^2(3) = 3.70$, $p = .295$; $RMSEA = .025$, 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, "In my next game, I will perform as I expect"; $\alpha = .91$ for this study) and (2) Team/Collective performance (4 items, "In the next game of my team, we will perform as we expect"; $\alpha = .93$ for this study). The final scores were 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 to the data but implicated the removal of item 2: $\chi^2(17) = 35.98$, $p = .005$; $RMSEA = .055$, 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 an acceptable sample size considering different recommendations Klem's (1995) overall recommendation of 200-300 participants for path analysis, as there is a tendency for covariances matrices to stabilize at this sample size. In order to evaluate the model fit, chi-square statistics (χ^2), confirmatory fit index (CFI), the root-mean-square error of approximation (RMSEA), and the standardized root-mean-square residual (SRMR) were used. CFI values of .95 and .90, and RMSEA and SRMR values of .05 and .08 are considered good and adequate fits, respectively (Arbuckle, 2008; 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. More specifically, coping perceptions present a moderate positive correlation with sport confidence and individual expectations of performance, meaning that the more athletes perceive they have the necessary resources to deal with the competition (stressful event), the higher their confidence and their expectation to succeed. Moreover, sport confidence has a moderate-strong positive correlation with expectations of individual and collective performance; that is, the higher athletes' self-confidence before the match, the higher their expectations to individually and collectively succeed.

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 ($.001 > r < .703$; $1.01 > VIF < 2.67$).

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.
Competitive 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)			
Sport Confidence													
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*

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: $\chi^2(26) = 159.30$, $p < .001$; $CFI = .917$, $RMSEA = .125$ (90% C.I. [.107; .144], $p_{close} < .001$); $SRMR = .091$; $AIC = 289.30$, $BCC = 295.13$, $BIC = 535.65$. Thus, Hypothesis 1 was partially supported. 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.

Table 2*Regression Weights for the Direct Model*

	<i>b</i>	SE	β	<i>p</i>
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

Note: Statistically significant relationships are represented in bold.

Mediation of Cognitive Appraisal

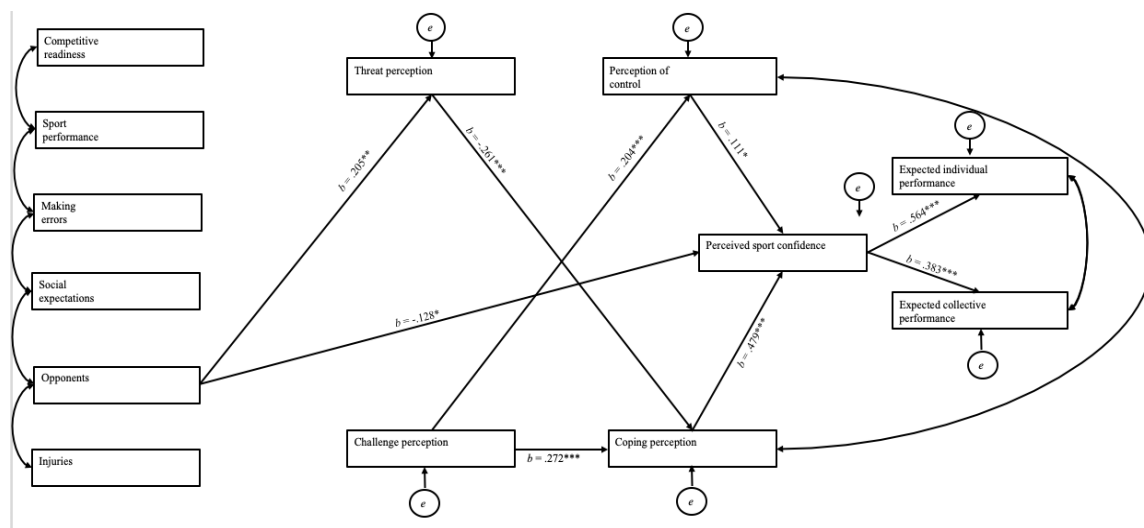
Hypothesis 2 stated that cognitive appraisal mediates the relationship between perceived competitive stressors (antecedent variable) and athletes' sport confidence and expected performance (consequent variables). Path analysis was used to test this hypothesis. The results showed an adequate fit of the proposed model to the data, $\chi^2(34) = 118.30$, $p < .001$; $CFI = .948$, $RMSEA = .087$ (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 competitive stressor of opponents.

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.

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 slightly higher than the ones from the total mediation model, the proposed model is more parsimonious and presents higher values of CFI and better SRMR values. When no differences in fit are found, a parsimonious model should be favored (see Kuha, 2004; Lin et al., 2017 for a review on comparison criteria). Therefore, it can be concluded that the proposed model assumed the best fit for the data.

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
RMSEA	0.13	0.87	.082
p -close	<.001	<.001	.001
SRMR	.091	.060	.068
CFI	.917	.948	.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); Akaike Information Criteria (AIC); Browne-Cudeck criterion (BCC); and Bayesian Information Criteria (BIC).

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 relate 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. Specifically, results indicate that the more athletes were concerned about their opponents, the more threatening they perceived the upcoming match to be, and the less they felt to possess the necessary coping strategies to deal with the competition situation which, in turn, lowered their sport confidence and their expectations to individually and collectively succeed. These results partially supported H1.

When it comes to youth sports, opponents would be, ideally, the least important source of stress. In fact, athletes' average response regarding sources of stress indicates that even though the competition is important to them, they do not seem particularly worried with their (lack) of competitive readiness, social expectations, opponents or injuries, as the higher sources of stress seem to be more related to worrying about making mistakes or potentially having a bad performance (cf. Table 1). Nevertheless, when examining the relationship between sources of stress and the remaining variables of the adaptation process, young athletes from our sample seem to give a particular relevance to opponents 24 to 48 hours before a game. Specifically, the results indicated that opponents were a crucial and an inherent part of athletes' competitive experience, as suggested by other research (e.g., Mellalieu et al., 2009). Results from "opponents" source of stress are somewhat complex of understanding. In fact, this competitive stressor was perceived by athletes as the lowest one when compared with the other five dimensions of *Questionnaire of Competitive Stressors in Sport*. This can be considered positive due the age range of athletes and the fact that they should be competing for learning and improving sports skills, not having "beating opponents" as the main purpose of playing soccer. Using the words of Côté and Hay (2002), athletes like the ones included in our study are in a transition period deciding between investing more in the sport activity (i.e., learning the strategic, competitive, and skills of each sport activity) or deciding to practice sports for recreational purpose (i.e., practicing sports without aspiring to reach an elite level of performance). However, this stressor was also the only one with negative significant correlations with expectations of performance and was the only one that made a unique contribution to the predication of threat perceptions and sport confidence in the model. In simple words, opponents did not seem to be "strong" stressor for athletes but it seem relevant to the way athletes perceive the sport activity and performance. 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, even though they are not presented as the “most important” source of stress, opponents seem to be key in *how* athletes interpret the upcoming game and, therefore, having a stronger relationship with cognitive appraisal when compared to the remaining sources of stress. When analyzing the Pearson correlations between sources of stress and cognitive appraisal, opponents are, indeed, more strongly correlated with threat and coping perceptions than the remaining sources of stress.

Moreover, 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 stressors 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; Samuel et al., 2023). 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 competitive stressors 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 competitive stressors; 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 competitive 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.

Limitations, Practical Implications and Future Research

This study attempted to provide a comprehensive framework to the process of adaptation to stress. Even though ensuring the competition was important and sufficiently stressful to athletes by using a critical incident approach, the study comprises some limitations. First of all, we did not have full control for the “difficulty” of the upcoming game/the level of the opponents – this is important especially because opponents seem to be the most important source of stress when it comes to athletes’ appraisal of the competition. Thus, it might be quite different whether athletes perceive opponents to be “better” or “worse” than them, which may influence their interpretation of the upcoming game. Regardless, we did ensure that the evaluated upcoming sport event corresponded to the “typical” stressful competitions of the season where it was decided the final championships positions. Second, this cross-sectional correlational design does not allow to conclude causal relationships among variables. There is a strong theoretical rationale that supports the order of variables included in the proposed model, allowing path analysis to test theoretical assumptions, but no causal inferences can be drawn. Moreover, a repeated-measures design would also allow us to test whether these relationships are stable over time.

Nevertheless, 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 (Simões & Gomes, 2019). For example, it is important to promote positive and challenging perspectives of competition (e.g., how to cope with stressful games, how to evaluate sports performance by setting controllable goals, how to increase feelings of competitive readiness, among others) and how to prevent negative threatening perspectives of competition (e.g., how to deal with errors, social expectations, and pressures from opponents). By intervening in cognitive appraisal, athletes can increase coping and control perceptions that may be critical aspects of youth sports practice.

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.

References

- Arbuckle, J. L. (2008). *AMOS 17 User's Guide*. SPSS.
- Arnold, R. S., & Fletcher, D. (2012). A research synthesis and taxonomic classification of the organizational stressors encountered by sport performers. *Journal of Sport and Exercise Psychology*, 34(3), 397–429. <https://doi.org/10.1123/jsep.34.3.397>
- Bartholomew, K. J., Arnold, R., Hampson, R. J., & Fletcher, D. (2017). Organizational stressors and basic psychological needs: The mediating role of athletes' appraisal mechanisms. *Scandinavian Journal of Medicine & Science in Sports*, 27, 2127–2139. <https://doi.org/10.1111/sms.12851>
- Côté, J., & Hay, J. (2002). Children's involvement in sport: A developmental perspective. In J. M. Silva & D. E. Stevens (Eds.), *Psychological foundations of sport* (pp. 484-502). Allyn and Bacon.
- Cumming, S. J. D., Turner, M. J., & Jones, M. (2017). Longitudinal changes in elite rowers' challenge and threat appraisals of pressure situations: A season-long observational study. *The Sport Psychologist*, 31(3), 217-226. <https://doi.org/10.1123/tsp.2016-0087>
- Dixon, J. G., Jones, M. V., & Turner, M. J. (2020). The benefits of a challenge approach on match day: Investigating cardiovascular reactivity in professional academy soccer players. *European Journal of Sport Science*, 20(3), 375-385. <https://doi.org/10.1080/17461391.2019.1629179>
- Doron, J., & Bourbousson, J. (2017). How stressors are dynamically appraised within a team during a game: An exploratory study in basketball. *Scandinavian Journal of Medicine & Science in Sports*, 27(12), 2080-2090. <https://doi.org/10.1111/sms.12796>
- Freeman, P., & Rees, T. (2009). How does perceived support lead to better performance? An examination of potential mechanisms. *Journal of Applied Sport Psychology*, 21(4), 429-441. <https://doi.org/10.1080/10413200903222913>

- Goh, Y. W., Swang, S., & Oei, T. P. S. (2010). The revised Transactional Model (RTM) of Occupational Stress and Coping: An improved process approach. *The Australian and New Zealand Journal of Organisational Psychology*, 3, 13-20. <https://doi.org/10.1375/ajop.3.1.13>
- Gomes, A. R. (2014). Positive human functioning in stress situations: An interactive proposal. In A. R. Gomes, R. Resende, & A. Albuquerque (Eds.), *Positive human functioning from a multidimensional perspective: Promoting stress adaptation* (Vol. 1, pp. 165-194). Nova Science.
- Gomes, A. R., Almeida, A., & Resende, R. (2019). Athletes' perception of leadership according to their perceptions of goal achievement and sport results. *Perceptual and Motor Skills*, 127(2) 415–431. <https://doi.org/10.1177/0031512519892384>
- Gomes, A. R., Faria, S., & Vilela, C. (2017). Anxiety and burnout in young athletes: The mediating role of cognitive appraisal. *Scandinavian Journal of Medicine & Science in Sports*, 27(12), 2116-2126. <https://doi.org/10.1111/sms.12841>
- Gomes, A.R., Simões, C., Morais, C., & Cunha, R. (2022). Adaptation to stress in football athletes: The importance of cognitive appraisal. *Frontiers in Psychology*, 13:939840. <https://doi.org/10.3389/fpsyg.2022.939840>
- Gomes, A. R., & Teixeira, P. (2016). Stress, cognitive appraisal, and psychological health: Testing instruments for health professionals. *Stress and Health*, 32(2), 167-172. <https://doi.org/10.1002/smi.2583>
- Gucciardi, D. F., Jackson, B., Coulter, T. J., & Mallett, C. J. (2011). The Connor-Davidson Resilience Scale (CD-RISC): Dimensionality and age-related measurement invariance with Australian cricketers. *Psychology of Sport and Exercise*, 12(4), 423-433. <https://doi.org/10.1016/j.psychsport.2011.02.005>
- Gustafsson, H., Sagar, S. S., & Stenling, A. (2017). Fear of failure, psychological stress, and burnout among adolescent athletes competing in high level sport. *Scandinavian Journal of Medicine & Science in Sports*, 27(12), 2091-2102. <https://doi.org/10.1111/sms.12797>
- Hase, A., O'Brien, J., Moore, L. J., & Freeman, P. (2019). The relationship between challenge and threat states and performance: A systematic review. *Sport, Exercise, and Performance Psychology*, 8(2), 123-144. <https://doi.org/10.1037/spy0000132>
- Hatzigeorgiadis, A., Zourbanos, N., Galanis, E., & Theodorakis, Y. (2011). Self-talk and sports performance: A meta-analysis. *Perspectives on Psychological Science*, 6(4), 348-356. <https://doi.org/10.1177/1745691611413136>

- Hays, K., Thomas, O., Maynard, I., & Bawden, M. (2009). The role of confidence in world-class sport performance. *Journal of Sports Sciences*, 27(11), 1185-1199. <https://doi.org/10.1080/02640410903089798>
- Hettlage, R., & Steinlin, M. (2006). *The critical incident technique in knowledge management-related contexts*. Ingenious Peoples Knowledge.
- Holt, N. L., & Neely, K. C. (2011). Positive youth development through sport: A review. *Revista de Iberoamericana de Psicología del Ejercicio y el Deporte*, 6(2), 299-316.
- Hu, L., & Bentler, P. (1999). Cut-off criteria for fit indices in covariance structure analysis: conventional criteria versus new alternatives. *Structural Equation Modeling*, 6, 1-55. <https://doi.org/10.1080/10705519909540118>
- Kaiseler, M., Polman, R. C. J., & Nicholls, A. R. (2013). Gender differences in stress, appraisal, and coping during golf putting. *International Journal of Sport and Exercise Psychology*, 11(3), 258-272. <https://doi.org/10.1080/1612197X.2013.749004>
- Klem, L. (1995). Path analysis. In L. G. Grimm & P. R. Yarnold (Eds.), *Reading and understanding multivariate statistics* (pp. 65–97). American Psychological Association.
- Kline, R. B. (2011). *Principles and practice of structural equation modeling* (3rd ed). Guilford Press.
- Kuha, J. (2004). AIC and BIC: Comparisons of assumptions and performance. *Sociological Methods & Research*, 33(2), 188-229. <https://doi.org/10.1177/0049124103262065>
- Lazarus, R. S. (1991). *Emotion and adaptation*. Oxford University.
- Lazarus, R. S. (1993). From psychological stress to the emotions: A history of changing outlooks. *Annual Review of Psychology*, 44, 1-21. <https://doi.org/10.1146/annurev.ps.44.020193.000245>
- Lazarus, R. S. (1999). *Stress and emotions: A new synthesis*. Free Association.
- Lin, L.C., Huang, P.H., & Weng, L.J. (2017). Selecting path models in SEM: A comparison of model selection criteria. *Structural Equation Modelling: A Multidisciplinary Journal*, <https://doi.org/10.1080/10705511.2017.1363652>
- Marôco, J. (2014). *Análise de equações estruturais: Fundamentos teóricos, software & aplicações* (2ª ed.).
- Martinet, G., & Ferrand, C. (2015). A field study of discrete emotions: Athletes' cognitive appraisals during competition. *Research Quarterly for Exercise and Sport*, 86, 51–62. <https://doi.org/10.1080/02701367.2014.975176>

- McGreary, M., Morris, R., & Whitehead, A. (2020). Thinking aloud: Stress and coping in junior cricket batsmen during challenge and threat states. *Perceptual and Motor Skills*, 127(6) 1095–1117. <https://doi.org/10.1177/0031512520938911>
- Mellalieu, S. D., Neil, R., Hanton, S., & Fletcher, D. (2009). Competition stress in sport performers: Stressors experienced in the competitive environment. *Journal of Sports Science*, 27(7), 729-744. <https://doi.org/10.1080/02640410902889834>
- Nicholls, A. R., Polman, R. C., & Levy, A. R. (2012). A path analysis of stress appraisals, emotions, coping, and performance satisfaction among athletes. *Psychology of Sport and Exercise*, 13(3), 263-270. <https://doi.org/10.1016/j.psychsport.2011.12.003>
- Palmwood, E. N., & McBride, C. A. (2017). Challenge vs. threat: The effect of appraisal type on resource depletion. *Current Psychology*, 1-8. <https://doi.org/10.1007/s12144-017-9713-6>
- Plakona, E., Parčina, I., Ludvig, A., & Tuzović, A. (2014). Self-confidence in sport. *Sport Science*, 7, 47-55.
- Ronkainen, N. J., Aggerholm, K., Ryba, T. V., & Allen-Collinson, J. (2020). Learning in sport: From life skills to existential learning. *Sport, Education and Society*. <https://doi.org/10.1080/13573322.2020.1712655>
- Scanlan, T. K., Stein, G. L., & Ravizza, K. (1991). An in-depth study of former elite figure skaters: III. Sources of stress. *Journal of Sport & Exercise Psychology*, 13(2), 103-120.
- Sharoff, L. (2008). Critique of the critical incident technique. *Journal of Research in Nursing*, 13, 301-309. <https://doi.org/10.1177/1744987107081248>
- Simões, C., & Gomes, A. R. (2019). The interactive process of adaptation to stress and implications for intervention. In N. Mucci, G. Giorgi, F. Sderci, & G. Arcangeli (Eds.), *Occupational stress: Risk factors, prevention and management strategies* (pp. 1-42). Nova Science.
- Samuel, R. D., Stambulova, N., Galily, Y., & Tenenbaum, G. (2023). Adaptation to change: A meta-model of adaptation in sport. *International Journal of Sport and Exercise Psychology*. Advance online publication. <https://doi.org/10.1080/1612197X.2023.2168726>
- Skinner, N., & Brewer, N. (2002). The dynamics of threat and challenge appraisals prior to stressful achievement events. *Journal of Personality and Social Psychology*, 83, 678-692. <https://doi.org/10.1037//0022-3514.83.3.678>
- Tamminen, K. A., Crocker, P. R. E., & McEwen, C. E. (2016). Emotional experiences and coping in sport: How to promote positive adaptational outcomes in sport. In A. R. Gomes,

- R. Resende, & A. Albuquerque (Eds.), *Positive human functioning from a multidimensional perspective* (pp.143-162). Nova Science.
- Tenenbaum, G., Lane, A., Razon, S., Lidor, R., & Schinke, R. (2015). Adaptation: A two-perception probabilistic conceptual framework. *Journal of Clinical Sport Psychology*, 9(1), 1–23. <https://doi.org/10.1123/jcsp.2014-0015>
- van Rens, F. E., Burgin, M., & Morris-Binelli, K. (2019). Implementing a pressure inurement training program to optimize cognitive appraisal, emotion regulation, and sport self-confidence in a women's state cricket team. *Journal of Applied Sport Psychology*, 1-18. <https://doi.org/10.1080/10413200.2019.1706664>
- Vealey, R. S. (1986). Conceptualization of sport confidence and competitive orientation: Preliminary investigation and instrument development. *Journal of Sport Psychology*, 8, 221-246. <https://doi.org/10.1123/jsp.8.3.221>
- Vealey, R. S. (2009). Confidence in sport. In B.W. Brewer (Ed.), *Sport Psychology* (pp. 43-52). Wiley-Blackwell.
- Vierimaa, M., Erickson, K., Côté, J., & Gilbert, W. (2012). Positive youth development: A measurement framework for sport. *International Journal of Sports Science & Coaching*, 7(3), 601-614. <https://doi.org/10.1260/1747-9541.7.3.601>
- Wong, R. S. K., Teo, E. W., & Polman, R. C. J. (2015). Stress, coping, coping effectiveness and emotions in Malaysian Elite tenpin bowlers: Role of context and importance. *International Journal of Sport and Exercise Psychology*, 13(4), 320–334. <https://doi.org/10.1080/1612197X.2014.999345>