
Emotional experiences of referees: Is it important to analyse intensity and direction?

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Abstract

This study analysed the intensity and direction of referee's emotions 24 to 48 hours before a game, looking into the relation between stress, cognitive appraisal, and performance perception. Participants were 708 football referees, 91.2% male and 8.8% female. The results indicate a higher prevalence of positive rather than negative emotions before the game, showing that, when emotions were perceived as facilitating the referees' sports performance, they were more likely to better adapt to the game. Additionally, emotions intensity played an important role in the way referees feel before a game. In sum, the data revealed the importance of considering the intensity and direction of the emotions felt by referees, as well as the importance of training strategies to regulate the intensity of emotions and strategies that help referees interpret the effects of their emotions.

KEYWORDS: Refereeing, Emotions, Stress, Cognitive Appraisal, Sports Performance.

Experiências emocionais dos árbitros: É importante analisar intensidade e direção?

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Resumo

Este estudo analisou a intensidade e direção das emoções dos árbitros 24 a 48 horas antes de um jogo, testando as relações com o estresse, avaliação cognitiva e percepção de rendimento. Participaram 708 árbitros de futebol do sexo masculino (91.2%) e feminino (8.8%). Os resultados indicam uma maior prevalência de emoções positivas do que negativas antes do jogo, verificando-se que perceber as emoções como meio de facilitar o rendimento desportivo dos árbitros relacionou-se com uma "melhor" adaptação ao jogo. Além disso, verificou-se o papel preponderante da intensidade das emoções no modo como os árbitros se sentem antes do jogo. Em síntese, os dados revelam a importância de considerar a intensidade e direção das emoções sentidas pelos árbitros, sendo importante treinarem estratégias de regulação da intensidade das emoções bem como estratégias de interpretação dos efeitos das emoções no seu rendimento.

Palavras-chave: Arbitragem, Emoções, Estresse, Avaliação Cognitiva, Rendimento Desportivo.

Experiencias emocionales de los árbitros: ¿Es importante analizar la intensidad y la dirección?

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Resumen

Este estudio analizó la intensidad y dirección de las emociones de los árbitros 24-48 horas antes de un partido, y analizó la relación entre el estrés, la evaluación cognitiva y la percepción del rendimiento. Los participantes fueron 708 árbitros de fútbol, 91,2% hombres y 8,8% mujeres. Los resultados indican una mayor prevalencia de emociones positivas que negativas antes del juego, lo que demuestra que, cuando se percibía que las emociones facilitaban el rendimiento deportivo de los árbitros, era más probable que se adaptaran mejor al juego. Además, la intensidad de la emoción jugó un papel importante en la forma en que los árbitros se sienten antes del partido. En resumen, los datos revelaron la importancia de considerar la intensidad y dirección de las emociones de los árbitros, y la importancia de entrenamiento para regulación de la intensidad de las emociones, así como estrategias para interpretar los efectos de las emociones.

Palabras-clave: Árbitro, Emociones, Estrés, Evaluación Cognitiva, Rendimento Deportivo.

Introduction

The referee is responsible for applying the rules of the game and ensuring that players comply with them (Ferreira & Brandão, 2012). Their decisions are important to all those who are part of the sport activity, are often irreversible, and typically occur in milliseconds (Gimeno, Buceta, Lahoz, & Sanz, 1998). Some decisions can be so crucial as to determine the outcome of an entire match or even a competition. Despite this crucial role, coaches, players, supporters, and the media constantly mention the actions of referees (Balch & Scott, 2007), using verbal abuse, physical threats, and even actual physical abuse (Weinberg & Richardson, 1990), whereas positive reinforcements are virtually non-existent (Ferreira & Brandão, 2012).

Like athletes, referees' performance can be influenced by emotions (Friesen, Devonport, & Lane, 2017), as demonstrated by some research on this topic (Hanin, 2000; Lane, Beedie, Jones, Uphill, & Devonport, 2012). In fact, practicing sports is accompanied by positive (i.e., happiness and excitement) or negative emotions (i.e., anxiety, dejection, and anger) before or during the competition (Lazarus 2000a; Jones, 2003; Hanin, 2007). However, there is a scarcity of findings about the role of emotions in the refereeing activity. Therefore, this study aims to understand how the emotions felt by referees influence the way they adapt to stressful situations. An emotion is a psychophysiological reaction that organizes relationships with the environment (Lazarus, 2000b, p.230), which can be understood as a response to a stimulus, either real or imaginary (Deci & Ryan, 1980). As stated by Lazarus, an emotion is "an organized psychophysiological reaction to ongoing relationships with the environment, most often, but not always, interpersonal or social" (Lazarus, 2000b, p. 230).

Research in the field of sports has highlighted the difference between the intensity and direction of emotions (Jones & Hanton, 2001). Intensity represents the magnitude with which emotions can be expressed (Robazza, Bortoli, & Hanin, 2006). However, some authors argue that the intensity of emotions may not be as important as the interpretation of their direction, because they can facilitate or debilitate the sports performance (Jones, 1991). Therefore, it is important to consider the intensity of emotions and the direction of emotional changes in order to better understand the relationship between emotions and sports performance (Mellalieu, Hanton, & Fletcher, 2006; Robazza & Bortoli, 2007). Although some evidence exists about differential effects of intensity and direction of emotions in the athletes' functioning and performance (Hanin, 2000; Jones & Hanton, 2001, Martinet & Ferrand, 2009), the actual findings do not allow to clearly understand the impact of both dimensions of emotions, particularly in referees.

In this study, this analysis was done by adopting a critical incident methodology (Flanagan, 1954) that allowed us to evaluate the referees' emotions 24 to 48 hours before a game and their subsequent levels of stress, cognitive appraisal, and performance perception. Specifically, emotions represent the independent variable and intensity or direction of emotions (according to the specific independent variable tested) plus stress, cognitive appraisal, and perceived performance represent the dependent variables, since they all are fundamental dimensions of events of adaptation to stress (Gomes, 2014; Lazarus, 1991, 1999; Woodman, 2014).

The study of these relations between independent and depend variables employed a multidimensional perspective of adaptation to stress. The transactional model of Lazarus and Folkman (1984) argues that a potential stressful event activates a cognitive appraisal at two levels (Lazarus, 1991). The primary cognitive appraisal indicates whether the stress situation is relevant or important for the individual (Gomes, 2013). The event (stress situation) is then evaluated as threatening or challenging (Vilela & Gomes, 2015). In turn, secondary cognitive appraisal occurs when individuals evaluate their ability to deal with the pressures of their activity (Gomes, 2013). Therefore, in the case of referees, it is important to analyze if emotions can influence the way the stressful situation is perceived (primary cognitive appraisal) and also if emotions can influence the way referees evaluate their resources and control to deal with the stressful situation (secondary cognitive appraisal).

Regarding sport performance, Lazarus (1999, 2000a) suggested that the emotions experienced by individuals can influence their performance, creating behavioral tendencies or impulses that are difficult to inhibit and modify. If the emotions experienced are seen as positive (i.e., happiness and excitement), better results are more likely to occur; if emotions are seen as negative (i.e., anxiety, dejection, and anger) performance may worsen (McCarthy, 2011). Martins (2010) argues that emotions, both negative and positive, can have functional or dysfunctional effects on sports performance. The notion of interpreting the direction of emotions has brought a significant advance in understanding this relationship (Cerin, 2003; Cerin, Szabo, Hunt, & Williams, 2000; Hagan, Pollmann, & Schack, 2017; Mellalieu et al., 2006). Thus, it is relevant to study the influence of the intensity and direction of emotions on the referees' sport performance.

In sum, this study aims to understand how emotions influence soccer referees in order to adapt, deal with, and react to a stressful situation in sport. For this, the critical incident methodology was used, that is, 24 to 48 hours before a game relevant to the referees. Thus, our goals were to:

1. Analyze the referees' psychological experience before a game, with particular emphasis on emotional reactions.
2. Analyze the differences in the perception of direction of emotions, stress, cognitive appraisal, and performance according to emotional intensity felt by referees.
3. Analyze the differences in the perception of intensity of emotions, stress, cognitive appraisal, and performance according to emotional direction felt by referees.

Method

Study design

This was a cross-sectional study, employing a "critical incident" approach, in which participants answer the questionnaires keeping in mind their next game. Participants filled in the questionnaires 24h-48h before this game. This approach is valuable to explore "what helps or hinders in a particular experience or activity" (Butterfield et al., 2009, p. 268), and in our

case it was used to explore the psychological experiences of referees before one critical event related to the next game.

Participants

This study used a non-probabilistic convenience sample. Participants included 708 soccer referees, 62 (8.8%) female and 646 (91.2%) male, all native Portuguese speakers. Participants' ages ranged between 17 and 53 years old ($M = 26.81$; $SD = 7.32$). Referees worked in different categories: under 9 ($n = 29$; 4.1%), under 11 ($n = 43$; 6.1%), under 18 ($n = 54$; 7.6%), under 20 ($n = 92$; 13.0%) and seniors ($n = 490$; 69.2 %). They also belonged to several levels: district level ($n = 532$; 75.1%), national ($n = 162$; 22.9%), professional ($n = 13$; 1.8%), and international ($n = 1$; 0.1%) level. Refereeing experience varied greatly from a few months to decades ($M = 7.13$; $SD = 5.62$).

Evaluation Instruments

Demographic Questionnaire, used to collect data on sex, age, age category, ranking category, years of refereeing practice, and the ranking and age category referees currently work in.

Referees Stress Questionnaire – RSQ (Gomes, Fontes, Rodrigues, & Dias, 2021). Evaluates potential sources of stress in the refereeing activity. It consists of 20 items, distributed over five subscales: errors ($\alpha = .90$); conflicts ($\alpha = .81$); sport condition ($\alpha = .84$); sports career ($\alpha = .88$); home and sport interface ($\alpha = .88$). Items were answered on a five-point Likert-type scale (0 = *no stress*; 2 = *moderate stress*; 4 = *too much stress*). Higher scores indicate higher levels of stress in each dimension. We used the specific version of this questionnaire, where the referees indicate the level of stress they feel in relation to their next game. Confirmatory factor analysis showed good psychometric properties of the instrument for this study (χ^2 (157 df) = 721,617, $p < .001$; CMIN/DF = 4,596; RMSEA = .071, 90% CI [.066; .077]; CFI = .934; TLI = .920) (Bentler, 2007).

Primary and Secondary Cognitive Appraisal Scale – PSCAS. (Gomes & Teixeira, 2016). Evaluates primary and secondary cognitive appraisal. The primary appraisal includes three subscales: importance perception ($\alpha = .93$); threat perception ($\alpha = .84$); and challenge perception ($\alpha = .91$). The secondary cognitive appraisal is comprised of two subscales: coping perception ($\alpha = .89$) and control perception ($\alpha = .69$). The scale evaluates a total of fifteen items, answered on a seven-point Likert-type scale (0 = *Is not at all important to me*; 6 = *Is very important to me*, for work importance). Higher scores indicate higher appraisal in each dimension. We used the specific version of the instrument, asking participants to evaluate their next game in the five dimensions of the PSCAS. Confirmatory factor analysis showed good psychometric properties of the instrument for this study (χ^2 (80 df) = 291.085, $p < .001$; CMIN/DF = 3.639; RMSEA = .061, 90% CI [.054; .069]; CFI = .968; TLI = .958) (Bentler, 2007).

Sports Emotions Questionnaire – SEQ (Gomes et al., 2021, adapted from Jones, Lane, Bray, Uphill, & Catlin, 2005). This instrument evaluates a set of emotions distinguished in literature as relevant and frequent

in sport settings (Jackson, 2000; Jones, 1995; Lane & Terry, 2000), and was developed considering theoretical proposals of emotions, in terms of construct conceptualization (Fredrickson, 2001), in terms of what distinguishes emotion, mood, and affect (Lane & Terry, 2000), and in terms of how to distinguish distinct discrete emotions (Lazarus, 1999). Besides, this instrument was developed to evaluate pre-game emotions (Jones et al., 2005) which is in accordance with the procedure of data collection adopted in our study. For all these reasons, this instrument represents a well-known measure of emotions in sports, and is used in several studies (see Allen, Jones, McCarthy, Sheehan-Mansfield, & Sheffield, 2013; Arnold & Fletcher, 2015; González-García, Martinent, & Pelegrín, 2020; Vast, Young, & Thomas, 2010). The questionnaire evaluates the subjective feelings associated with five major emotions in sports contexts: anxiety ($\alpha = .84$), dejection ($\alpha = .88$), anger ($\alpha = .88$), excitement ($\alpha = .73$), and happiness ($\alpha = .92$). It includes 22 items, answered on a five-point Likert-type scale (0 = *Not at all*; 4 = *Extremely*). Higher scores indicate a greater experience of emotion or emotional intensity in each emotion. For the purpose of this study, it was also evaluated the direction of emotions, i.e., its impact on referee's performance, by including another Likert-type scale for each item with seven points (-3 = *Very negative*; 0 = *Indifferent*; +3 = *Very positive*). Higher scores indicate a more positive effect of each emotion on the referees' performance. We used the pre-competitive version of the instrument which asks the participants to answer considering the next game. Confirmatory factor analysis showed good psychometric properties of the instrument for this study (χ^2 (197 df) = 838,475, $p < .001$; CMIN/DF = 4.256; RMSEA = .068, 90% CI [.063; .073]; CFI = .938; TLI = .927) (Bentler, 2007).

Sport Performance Perception Questionnaire – SPPQ (Gomes, Almeida, & Resende, 2019). Evaluates the referees' perception of their individual sports performance ($\alpha = .90$). Items were answered on a five-point Likert-type scale (1 = *Disagree*; 5 = *Completely agree*), where higher scores indicate a better perception of success or satisfaction with the individual's sports performance. We used the pre-competitive anticipatory version of this questionnaire, which evaluates the referees' expectations regarding the upcoming match. Confirmatory factor analysis showed good psychometric properties of the instrument for this study (χ^2 (2 df) = 9,303, $p = .010$; CMIN/DF = 4,651; RMSEA = .072, 90% CI [.030; .121]; CFI = .997; TLI = .983) (Bentler, 2007)

Procedure

Firstly, this cross-sectional study was submitted to and approved by the Ethics Committee of the authors' university (SECSH 016/2015). Then, we contacted the Football Associations of Braga, Viana do Castelo, Porto, and Aveiro, who all agreed to participate in the study by facilitating contact with referees. All instruments were distributed to the participants, along with informed consent. The questionnaires were answered between 24 and 48 hours before a game (critical incident), taking approximately 25 minutes to complete. Of the 720 questionnaires delivered, 708 were received (98.3% return rate).

Data analysis

The data treatment and analysis were performed using the SPSS program (version 24).

Results

General Psychological Functioning of Referees

Table 1 shows the statistics of the study's variables: happiness was the emotion most strongly felt by the majority of referees, with the greatest perceived effect on performance. The emotion felt with the least intensity by the majority of referees was anger. Dejection, on the other hand, had the least perceived effect on performance. The majority of referees felt, at most, moderate stress (68.5%) before their next game, which was evaluated as important. The biggest source of this stress was errors, with conflicts generating the lowest levels of stress. Regarding cognitive appraisal, the referees viewed the next game as less of a threat and more of a challenge, assuming a high coping perception. Finally, the referees perceived their individual performance before a game as good.

Table 1. Descriptive Statistics of Variables (N = 708)

Dimensions	
RSQ: General stress level	n (%)
No stress	66 (9.3)
A little stress	186 (26.3)
Moderate stress	233 (32.9)
A lot of stress	85 (12.0)
Much stress	20 (2.8)
RSQ: Stress factors	M (SD)
Errors	2.41 (.98)
Conflicts	1.29 (.83)
Sport condition	1.75 (1.08)
Sports career	2.21 (1.02)
Home and sport interface	1.64 (1.01)
SEQ: Intensity	
Anxiety	1.04 (.85)
Dejection	.41 (.70)
Anger	.33 (.66)
Excitement	2.12 (.90)
Happiness	2.54 (1.03)
SEQ: Direction	
Anxiety	.28 (1.02)
Dejection	.20 (1.16)
Anger	.22 (1.17)
Excitement	1.12 (.94)
Happiness	1.40 (1.05)
PSCAS: Cognitive appraisal	
Importance perception	4.58 (1.22)
Threat perception	1.48 (1.27)
Challenge perception	4.37 (1.29)
Coping perception	5.15 (.71)
Control perception	4.64 (.85)
QPRD: Performance	
Individual performance perception	3.90 (.88)

Intensity of Emotions and Psychological Functioning of Referees

This analysis considers the differences in psychological variables (e.g., direction of emotions, stress, cognitive appraisal, and perceived performance) as a function of the intensity of emotions. We defined two groups for comparison: those who felt the emotion with higher intensity and those who felt it with lower intensity. The groups of comparison were based in the median of the distribution of results in the emotions' intensity, which allowed to achieve the best distribution of groups. Results for dejection and anger will not be reported, since median results did not allow us to distribute participants into two groups, meaning that these two emotions were practically not reported by referees before the competition ($M = 0.41$ for dejection and $M = 0.33$ for anger). Multivariate analysis of variance (MANOVA) was used to compare both groups with distinct levels of emotion intensity (lower intensity versus higher intensity; Independent Variables) in terms of direction of emotions, stress, and cognitive appraisal (Dependent Variables). Univariate analysis of variance (ANOVA) was used to compare both groups with distinct levels of emotion intensity (lower intensity versus higher intensity; Independent Variables) in terms of perceived performance (Dependent Variable). This data analysis procedure is used in similar studies interested in studying sport emotions profiles of athletes (see González-García et al., 2020).

Table 2 includes significant results regarding the intensity of anxiety. Referees with higher anxiety intensity reported a greater facilitating effect on excitement and happiness (Wilks' $\lambda = .97$, $F(5, 700) = 3.74$, $p = .002$, $\eta p^2 = .03$), higher stress from all sources (Wilks' $\lambda = .84$, $F(5, 697) = 27.52$, $p > .001$, $\eta p^2 = .17$), higher threat and challenge perception, and lower coping perception (Wilks' $\lambda = .87$, $F(4, 703) = 25.86$, $p > .001$, $\eta p^2 = .13$) and lower perception of individual performance.

Table 2. Differences in Psychological Variables Regarding Anxiety Intensity

	Lower Intensity	High Intensity					
	<i>M (SD) (n)</i>	<i>M (SD) (n)</i>	<i>d.f.</i>	<i>F</i>	<i>p</i>	η_p^2	π
SEQ: Direction							
Excitement	1.02 (.95) (357)	1.23 (.92) (349)	1, 704	8.45	.004	.01	.83
Happiness	1.27 (1.06) (357)	1.52 (1.02) (349)	1, 704	9.73	.002	.01	.88
RSQ							
Errors	2.06 (.99) (353)	2.76 (.83) (350)	1, 701	105.87	<.001	.13	1.00
Conflicts	1.03 (.73) (353)	1.57 (.84) (350)	1, 701	82.50	<.001	.11	1.00
Sport condition	1.54 (1.06) (353)	1.98 (1.06) (350)	1, 701	30.59	<.001	.04	1.00
Sports career	1.91 (1.04) (353)	2.52 (.89) (350)	1, 701	69.04	<.001	.09	1.00
Home and sport interface	1.46 (.95) (353)	1.82 (1.04) (350)	1, 701	22.48	<.001	.03	1.00
PSCAS							
Threat perception	1.14 (1.17) (357)	1.84 (1.28) (351)	1, 706	57.55	<.001	.08	1.00
Challenge perception	4.14 (1.40) (357)	4.59 (1.11) (351)	1, 706	22.63	<.001	.03	1.00
Coping perception	5.28 (.71) (357)	5.00 (.69) (351)	1, 706	28.57	<.001	.04	1.00
SPPQ							
Individual performance perception	3.99 (.87) (357)	3.80 (.88) (350)	1, 705	8.87	.003	.01	.85

Table 3 includes significant results regarding the intensity of excitement. The higher intensity of excitement corresponded to a higher perception of the facilitating effects of all emotions (Wilks' $\lambda = .77$, $F(5, 700) = 41.72$, $p > .001$, $\eta_p^2 = .23$), higher stress from errors, sports career, and sport condition (Wilks' $\lambda = .97$, $F(5, 697) = 3.98$, $p = .001$, $\eta_p^2 = .03$). Finally, a higher intensity of excitement was related with higher challenge perception, coping perception, and control perception (Wilks' $\lambda = .83$, $F(4, 703) = 36.36$, $p > .001$, $\eta_p^2 = .17$) and individual performance perception.

Table 3. Differences in Psychological Variables Regarding Excitement Intensity

	Higher intensity	Lower intensity					
	<i>M (SD) (n)</i>	<i>M (SD) (n)</i>	<i>d.f.</i>	<i>F</i>	<i>p</i>	ηp^2	π
SEQ: Direction							
Anxiety	.39 (1.14) (363)	.17 (.86) (343)	1, 704	8.16	.004	.01	.81
Dejection	.34 (1.30) (363)	.04 (.97) (343)	1, 704	12.16	.001	.02	.94
Anger	.34 (1.33) (363)	.09 (.97) (343)	1, 704	8.44	.004	.01	.83
Excitement	1.55 (.86) (363)	.67 (.80) (343)	1, 704	199.50	<.001	.22	1.00
Happiness	1.12 (.96) (363)	1.00 (.99) (343)	1, 704	110.81	<.001	.14	1.00
RSQ							
Errors	2.51 (.95) (360)	2.30 (1.00) (343)	1, 701	8.93	.003	.01	.85
Sport condition	1.86 (1.11) (360)	1.65 (1.03) (343)	1, 701	7.13	.008	.01	.76
Sports career	2.37 (.99) (360)	2.05 (1.02) (343)	1, 701	17.64	<.001	.03	.99
PSCAS							
Challenge perception	4.87 (1.00) (364)	3.83 (1.34) (344)	1, 706	140.11	<.001	.17	1.00
Coping perception	5.23 (.64) (364)	5.06 (.78) (344)	1, 706	10.43	.001	.02	.90
Control perception	4.73 (.80) (364)	4.54 (.88) (344)	1, 706	9.40	.002	.01	.87
QPRD							
Individual performance perception	4.07 (.76) (363)	3.71 (.96) (344)	1, 705	29.96	<.001	.04	1.00

Table 4 includes significant results regarding the intensity of happiness. The higher intensity of happiness corresponded to a higher perception of the facilitating effects of all emotions (Wilks' $\lambda = .70$, $F(5, 700) = 59.37$, $p > .001$, $\eta p^2 = .30$) and to less stress from conflicts (Wilks' $\lambda = .98$, $F(5, 697) = 3.13$, $p = .08$, $\eta p^2 = .02$). Additionally, referees who felt happiness more intensely reported lower threat perception and higher challenge, coping perception, control perception (Wilks' $\lambda = .79$, $F(4, 703) = 47.90$, $p > .001$, $\eta p^2 = .21$), and higher individual performance perception.

Table 4. Differences in Psychological Variables Regarding Happiness Intensity

	<u>Higher intensity</u>	<u>Lower intensity</u>					
	<i>M (SD) (n)</i>	<i>M (SD) (n)</i>	<i>d.f.</i>	<i>F</i>	<i>p</i>	<i>ηp²</i>	<i>π</i>
SEQ: Direction							
Anxiety	.38 (1.14) (358)	.19 (.87) (348)	1, 704	6.23	.013	.01	.70
Dejection	.31 (1.37) (358)	.08 (.87) (348)	1, 704	7.25	.007	.01	.77
Anger	.31 (1.35) (358)	.13 (.95) (348)	1, 704	4.02	.045	.01	.52
Excitement	1.52 (.85) (358)	.71 (.85) (348)	1, 704	160.50	<.001	.19	1.00
Happiness	1.95 (.91) (358)	.82 (.85) (348)	1, 704	289.98	<.001	.29	1.00
RSQ							
Conflicts	1.23 (.82) (356)	1.36 (.84) (347)	1, 701	4.20	.041	.01	.54
PSCAS							
Threat perception	1.38 (1.22) (360)	1.59 (1.31) (348)	1, 706	5.08	.024	.01	.62
Challenge perception	4.93 (1.00) (360)	3.78 (1.28) (348)	1, 706	177.78	<.001	.20	1.00
Coping perception	5.24 (.66) (360)	5.05 (.76) (348)	1, 706	13.06	<.001	.02	.95
Control perception	4.74 (.82) (360)	4.53 (.86) (348)	1, 706	10.87	<.001	.02	.91
QPRD							
Individual performance perception	4.14 (.77) (314)	3.70 (.91) (393)	1, 705	47.31	<.001	.06	1.00

Direction of Emotions and Psychological Functioning of Referees

In this case, differences in the psychological variables (e.g., intensity of emotions, stress levels, cognitive appraisal, and perceived performance) were analyzed as a function of the direction of emotions. The SEQ instrument evaluated if emotions have a debilitating, indifferent, or facilitating effect on referees' performance. Therefore, we created three comparison groups: the Debilitating Effect Group (participants who scored between -3 and -1.01), the Indifferent Effect Group (from -1 to 1), and the Facilitating Effect Group (between 1.01 and 3). Debilitating effect of excitement and happiness emotions will not be reported, since the number of referees reporting this effect was residual ($n = 4$ for excitement and $n = 5$ for happiness). Multivariate analysis of variance (MANOVA) was used to compare groups of direction of emotions (Debilitating, Indifferent, and Facilitating Groups; Independent Variables) in terms of intensity of emotions, stress, and cognitive appraisal (Dependent Variables). Univariate analysis of variance (ANOVA) was used to compare both groups of direction of emotions (Debilitating, Indifferent, and Facilitating Groups; Independent Variables) in terms of perceived performance (Dependent Variable).

Table 5 includes significant results regarding the direction of anxiety. Results indicated that the referees who experienced anxiety as debilitating showed higher intensity of anxiety, and the referees who experienced anxiety as indifferent assumed less levels of excitement and happiness (Wilks' $\lambda = .92$, $F(10, 1398) = 6.09$, $p > .001$, $\eta p^2 = .04$). Referees who reported an debilitating effect of anxiety showed higher stress from the stress sources of errors and sports career (Wilks' $\lambda = .96$, $F(10, 1388) = 3.22$, $p > .001$, $\eta p^2 = .02$). Referees who experienced anxiety as debilitating showed higher threat perception; referees who experienced anxiety as indifferent showed lower challenge perception, and the referees who experienced anxiety as facilitating showed higher coping perception and control perception (Wilks' $\lambda = .97$, $F(8, 1400) = 2.70$, $p = .006$, $\eta p^2 = .02$), and also higher perception of individual performance.

Table 5. Differences in Psychological Variables Regarding Anxiety Direction

	<u>Debilitating effect</u>	<u>Indifferent effect</u>	<u>Facilitating effect</u>					
	<i>M (SD) (n)</i>	<i>M (SD) (n)</i>	<i>M (SD) (n)</i>	<i>d.f.</i>	<i>F</i>	<i>p</i>	<i>ηp²</i>	<i>π</i>
SEQ: Intensity								
Anxiety	1.50 (.94) (66)	.96 (.80) (485)	1.10 (.91) (155)	2, 703	12.61	<.001	.04	1.00
Excitement	2.30 (.94) (66)	1.99 (.89) (485)	2.43 (.80) (155)	2, 703	16.10	<.001	.04	1.00
Happiness	2.74 (.96) (66)	2.39 (1.05) (485)	2.88 (.91) (155)	2, 703	15.36	<.001	.04	1.00
RSQ								
Errors	2.89 (.88) (66)	2.34 (.95) (481)	2.40 (1.03) (154)	2, 698	9.26	<.001	.03	.98
Sports career	2.55 (1.05) (66)	2.16 (1.00) (481)	2.25 (1.04) (154)	2, 698	4.50	.011	.01	.77
PSCAS								
Threat perception	1.69 (1.08) (66)	1.52 (1.27) (485)	1.28 (1.32) (155)	2, 703	3.00	.050	.01	.58
Challenge perception	4.59 (1.20) (66)	4.27 (1.28) (485)	4.56 (1.30) (155)	2, 703	4.18	.016	.01	.74
Coping perception	5.03 (.76) (66)	5.12 (.69) (485)	5.29 (.76) (155)	2, 703	4.39	.013	.01	.76
Control perception	4.66 (.75) (66)	4.59 (.81) (485)	4.80 (.98) (155)	2, 703	3.04	.049	.01	.59
QPRD								
Individual performance perception	3.66 (.94) (66)	3.86 (.90) (484)	4.11 (.76) (155)	2, 702	7.21	.001	.02	.93

Table 6 includes significant results regarding the direction of dejection. Results showed that the referees who experienced a debilitating effect of dejection showed higher intensity of anxiety and dejection; and the referees who experienced a facilitating effect of dejection showed higher intensity of excitement and happiness (Wilks' $\lambda = .91$, $F(10, 1398) = 6.40$, $p > .001$, $\eta p^2 = .04$). The referees who reported a debilitating effect of dejection assumed higher levels of stress associated with the sports career (Wilks' $\lambda = .98$, $F(10, 1388) = 1.78$, $p = .06$, $\eta p^2 = .01$). The referees who experienced a facilitating effect of dejection assumed higher challenge perception, higher coping perception (Wilks' $\lambda = .98$, $F(8, 1400) = 2.00$, $p = .04$, $\eta p^2 = .01$), and higher individual performance perception.

Table 6. Differences in Psychological Variables Regarding Dejection Direction

	<u>Debilitating effect</u>	<u>Indifferent effect</u>	<u>Facilitating effect</u>					
	<i>M (SD) (n)</i>	<i>M (SD) (n)</i>	<i>M (SD) (n)</i>	<i>d.f.</i>	<i>F</i>	<i>p</i>	<i>ηp²</i>	<i>π</i>
SEQ: Intensity								
Anxiety	1.22 (.91) (81)	.99 (.82) (488)	1.11 (.91) (137)	2, 703	3.07	.047	.01	.59
Dejection	.60 (.92) (81)	.40 (.66) (488)	.34 (.67) (137)	2, 703	3.84	.022	.01	.70
Excitement	2.19 (.97) (81)	1.99 (.89) (488)	2.54 (.76) (137)	2, 703	21.73	<.001	.06	1.00
Happiness	2.68 (1.07) (81)	2.40 (1.05) (488)	2.93 (.83) (137)	2, 703	15.84	<.001	.04	1.00
RSQ								
Sports career	2.45 (.95) (81)	2.15 (1.04) (484)	2.30 (.97) (136)	2, 698	3.59	.028	.01	.67
PSCAS								
Challenge perception	4.36 (1.09) (81)	4.28 (1.34) (488)	4.66 (1.17) (137)	2, 703	4.62	.01	.01	.78
Coping perception	5.09 (.72) (81)	5.12 (.73) (488)	5.28 (.65) (137)	2, 703	3.11	.045	.01	.60
SPPQ								
Individual performance perception	3.71 (.98) (81)	3.86 (.89) (487)	4.15 (.73) (137)	2, 702	8.14	<.001	.02	.96

Table 7 includes significant results regarding the direction of anger. Results indicated that the referees who experienced an indifferent effect of anger showed lower levels of intensity of dejection, excitement and happiness (Wilks' $\lambda = .92$, $F(10, 1398) = 5.64$, $p > .001$, $\eta p^2 = .04$). The referees who reported an indifferent effect of anger showed lower levels of stress related to sport condition and sports career (Wilks' $\lambda = .97$, $F(10, 1388) = 1.84$, $p = .05$, $\eta p^2 = .01$). Referees who experienced a facilitating effect of anger showed higher coping perception and control perception (Wilks' $\lambda = .98$, $F(8, 1400) = 1.95$, $p = .05$, $\eta p^2 = .01$), and higher individual performance perception.

Table 7. Differences in Psychological Variables Regarding Anger Direction

	<u>Debilitating effect</u>	<u>Indifferent effect</u>	<u>Facilitating effect</u>					
	<i>M (SD) (n)</i>	<i>M (SD) (n)</i>	<i>M (SD) (n)</i>	<i>d.f.</i>	<i>F</i>	<i>p</i>	<i>ηp²</i>	<i>π</i>
SEQ: Intensity								
Dejection	.59 (.94) (88)	.36 (.61) (469)	.47 (.77) (149)	2, 703	4.633	.010	.01	.78
Excitement	2.20 (.99) (88)	2.00 (.89) (469)	2.44 (.77) (149)	2, 703	14.01	<.001	.04	1.00
Happiness	2.68 (1.09) (88)	2.43 (1.01) (469)	2.78 (1.00) (149)	2, 703	7.93	<.001	.02	.95
RSQ								
Sport condition	1.90 (1.09) (87)	1.66 (1.08) (466)	1.96 (1.07) (148)	2, 698	5.08	.006	.01	.82
Sports career	2.37 (.96) (87)	2.15 (1.04) (466)	2.34 (.96) (148)	2, 698	3.17	.043	.01	.61
PSCAS								
Coping perception	5.12 (.71) (88)	5.11 (.73) (469)	5.30 (.65) (149)	2, 703	4.21	.015	.01	.74
Control perception	4.57 (.82) (88)	4.60 (.85) (469)	4.81 (.84) (149)	2, 703	3.69	.026	.01	.68
SPPQ								
Individual performance perception	3.70 (1.01) (88)	3.86 (.88) (468)	4.13 (.74) (149)	2, 702	7.84	<.001	.02	.95

Table 8 includes significant results regarding the direction of excitement. The referees who experienced a facilitating effect of excitement showed less intensity of dejection and higher intensity of anxiety, excitement, and happiness (Wilks' $\lambda = .75$, $F(5, 693) = 45.64$, $p > .001$, $\eta p^2 = .25$). Also, the referees who experienced a facilitating effect of excitement assumed lower threat perception, and higher challenge perception, coping perception, control perception (Wilks' $\lambda = .90$, $F(4, 694) = 19.28$, $p > .001$, $\eta p^2 = .10$), and higher individual performance perception.

Table 8. Differences in Psychological Variables Regarding Excitement Direction

	<u>Indifferent effect</u>	<u>Facilitating effect</u>					
	<i>M (SD) (n)</i>	<i>M (SD) (n)</i>	<i>d.f.</i>	<i>F</i>	<i>p</i>	<i>ηp²</i>	<i>π</i>
SEQ: Intensity							
Anxiety	.91 (.83) (279)	1.13 (.85) (420)	1, 697	11.41	.001	.02	.92
Dejection	.50 (.77) (279)	.33 (.62) (420)	1, 697	10.01	.002	.01	.89
Excitement	1.60 (.84) (279)	2.49 (.73) (420)	1, 697	216.17	<.001	.24	1.00
Happiness	2.04 (1.03) (279)	2.89 (.86) (420)	1, 697	138.86	<.001	.17	1.00
PSCAS							
Threat perception	1.62 (1.37) (279)	1.38 (1.20) (420)	1, 697	6.28	.012	.01	.71
Challenge perception	3.94 (1.37) (279)	4.67 (1.13) (420)	1, 697	58.98	<.001	.08	1.00
Coping perception	5.01 (.74) (279)	5.24 (.67) (420)	1, 697	19.12	<.001	.03	.99
Control perception	4.55 (.88) (279)	4.71 (.82) (420)	1, 697	5.68	.017	.01	.66
SPPQ							
Individual performance perception	3.71 (.98) (278)	4.03 (.77) (420)	1, 696	24.34	<.001	.34	1.00

Table 9 includes significant results regarding the direction of happiness. Results indicated that the referees who experienced a facilitating effect of happiness showed lower intensity of dejection and anger and higher intensity of anxiety, excitement, and happiness (Wilks' $\lambda = .76$, $F(5, 697) = 45.35$, $p = > .001$, $\eta p^2 = .25$). The referees who experienced a facilitating effect of happiness showed higher stress related to errors and sports career (Wilks' $\lambda = .97$, $F(5, 692) = 3.82$, $p = .002$, $\eta p^2 = .03$). The referees who experienced a facilitating effect of happiness showed lower threat perception and higher challenge perception and coping perception (Wilks' $\lambda = .87$, $F(4, 698) = 25.30$, $p > .001$, $\eta p^2 = .13$), and higher individual performance perception.

Table 9. Differences in Psychological Variables Regarding Happiness Direction

	<u>Indifferent effect</u>	<u>Facilitating effect</u>					
	<i>M (SD) (n)</i>	<i>M (SD) (n)</i>	<i>d.f.</i>	<i>F</i>	<i>p</i>	<i>ηp²</i>	<i>π</i>
SEQ: Intensity							
Anxiety	.90 (.84) (224)	1.10 (.85) (479)	1, 701	8.23	.004	.01	.83
Dejection	.61 (.80) (224)	.30 (.60) (479)	1, 701	32.68	<.001	.05	1.00
Anger	.44 (.74) (224)	.28 (.60) (479)	1, 701	9.61	.002	.01	.87
Excitement	1.64 (.90) (224)	2.36 (.79) (479)	1, 701	113.30	<.001	.14	1.00
Happiness	1.81 (1.05) (224)	2.89 (.81) (479)	1, 701	220.72	<.001	.24	1.00
RSQ							
Errors	2.26 (1.03) (222)	2.47 (.94) (476)	1, 696	7.52	.006	.01	.78
Sports career	2.05 (1.11) (222)	2.29 (.96) (476)	1, 696	8.88	.003	.01	.85
PSCAS							
Threat perception	1.67 (1.38) (224)	1.39 (1.20) (479)	1, 701	7.64	.006	.01	.79
Challenge perception	3.77 (1.38) (224)	4.66 (1.13) (479)	1, 701	83.07	<.001	.11	1.00
Coping perception	5.01 (.83) (224)	5.22 (.63) (479)	1, 701	14.02	<.001	.02	.96
SPPQ							
Individual performance perception	3.66 (.97) (223)	4.02 (.80) (479)	1, 700	25.96	<.001	.04	1.00

Discussion

This study analyzed the psychological experience of referees before a football match, with particular emphasis on the intensity and direction of emotional reactions and how they relate to important variables involved in human adaptation to stress (i.e., sources of stress, cognitive appraisal, and performance perception).

The psychological experience of our sample of referees was overall very positive. Happiness and excitement were the emotions most reported by the referees, indicating their overall positive mood before a game. This is an encouraging result, since we also found that happiness had the greatest effect on perceived performance, indicating that the majority of our sample was confident in their refereeing abilities. This is important, since it has been found that self-confidence has an impact on referees' performance (see, for example, Samuel, 2015).

In addition to the prevalence of positive emotions, most referees reported stress levels ranging from no stress to moderate stress (68.5%), which is consistent with other studies (Gencay, 2009; Johansen & Haugen, 2013) and helps explain their overall positive mood. However, for 14.8% of the referees the game to be played was perceived as considerably to highly stressful. This result should be considered relevant since high levels of stress can have negative effects on performance, mood, health, and, in the long-term, can lead to burnout. For example, Moen, Federici, and Abrahamsen (2015), found that stress in junior elite athletes was related with burnout and led to negative performance perception, not only in athletes' sports contexts, but also academically. It is thus important to find and describe the sources of the referees' stress. For our participants, the most prevalent source of stress was errors, which is also in accordance with the literature (Gustafsson, Sagar, & Stenling, 2017; Mark, Bryant, & Lehman, 1983) and the social ideal that mistakes in refereeing can have disastrous results for a team or player and are scrutinized by the media and fans for a long time (Balch & Scott, 2007; Ferreira & Brandão, 2012; Weinberg & Richardson, 1990). Also interesting was the fact that the majority of the referees evaluate the next game as challenging, rather than a threat, and saw themselves as having high coping perception, all of which can contribute to lower stress levels (Lazarus, 1991) and to a better adaptation to stress (Gomes, 2014).

Regarding the differences in the intensity of emotions in the remaining variables (e.g., emotions direction, stress, cognitive appraisal, and performance perception), data was interesting but somewhat complex. The referees that felt higher intensity of anxiety (compared with those with lower anxiety intensity) felt higher facilitating effect of excitement and happiness, but also experienced higher stress from all stress sources, higher threat perception, lower coping perception, and lower individual performance perception, which is in line with what was expected. However, somewhat unexpectedly, increases in anxiety intensity corresponded also to a higher challenge perception. This suggest that anxiety can produce not only negative effects, but may, in some cases, lead to a more positive pattern of adaptation to stress, as has been suggested by other authors (see Johansen & Haugen, 2013; Lazarus, 2000a; Martinent & Ferrand, 2015).

As for the intensity of excitement, it was found that the group with higher intensity reported a facilitating effect of anxiety, excitement, and

happiness, and a debilitating effect of dejection and anger (compared with those with lower excitement intensity). All of these results are in line with the current literature (Jones, 2003). These referees also experience higher levels of stress from errors and from their sports career. Interestingly, they experienced lower levels of stress stemming from their sport condition. This may suggest that when referees feel more excited (i.e., experience positive feelings regarding their physical and psychological well-being), this intensity can decrease the negative stress experience regarding their sport condition for the next game. It should also be noted that the referees showing higher intensity of excitement evaluated the game more positively (higher challenge perception, coping perception, and control perception) and displayed a better individual performance perception (compared with those with lower excitement intensity), thus reinforcing the role of positive emotions in human functioning and adaptation (Gomes, Abreu, Póvoa, & Vaz, 2013; Santos, 2017). In all, these results indicate that higher intensity of excitement may be beneficial for referees in a pre-competitive context.

Regarding the intensity of happiness, more intense feelings of this emotion corresponded to a higher perception of the facilitating effects of all emotions, less stress from the stress source of conflicts, lower threat perception, higher challenge perception, higher coping perception, and higher control perception (compared with those with lower happiness intensity). These referees also reported better individual performance perception. These data reinforce the role of positive emotions, in this case happiness, in positive human functioning and adaptation to stress (Matus, Orozco, Aragón, & Loving, 2016; Uphill, Groom, & Jones, 2014). It is undoubtedly an emotion worth striving for before a game.

Emotions were also tested in terms of their direction (i.e., their effects) on the remaining study variables (e.g., emotions intensity, stress, cognitive appraisal, and perceived performance). The referees were divided into two or three groups (depending on the frequency of responses) according to the facilitating, indifferent, or debilitating effects of emotions. Results were more stable in this dimension. As expected, when the referees experienced emotions as having a facilitating effect, they showed higher intensity of excitement and happiness, lower threat perception, higher coping perception, higher control perception, and better individual performance perception. The referees whose emotions, both positive and negative, had an indifferent effect showed lower levels of anxiety intensity, and lower stress from errors and from their sport career, both of which were also to be expected. This suggests that these referees are less emotionally reactive and less stressed regarding their next game. Finally, the referees that perceived positive emotions as having a facilitating effect on their performance and who evaluate the game more positively also reported a better individual sports performance perception. These results parallel those found in the literature, as verified in a study with lacrosse referees (Friesen et al., 2017). Overall, referees will benefit from experiencing emotions as facilitating, although referees who experience indifferent effects of emotions assume less stress and lower anxiety.

This study has some limitations. Firstly, the majority of participants were male, and very few were professional referees. Although the misrepresentation of female referees does reflect the current scenario, this is still a rather homogenous sample. In the future, researchers should include

referees from different competitive divisions, as well as attempt to include more female participants. Secondly, the phenomenon of adaptation to stress might be better captured in a longitudinal, rather than transversal, study. This would better capture the dynamic process of adaptation to stress than the critical incident methodology used in this study. Still, given the costs associated with such methods, we opted for the critical incident method, which is still quite capable of capturing certain aspects of adaptation to stress in football referees.

Conclusion

Despite these limitations, our study does draw some conclusions that may be helpful for future research and practice. Firstly, it would be interesting to compare the results of professional and non-professional referees. Future research could also aim to compare the main and the assistant referee, as they perform different roles. It would also be useful to increase our understanding of how emotions influence burnout, since refereeing can be an experience that creates feelings of frustration, often due to criticism and outside expectations. These conditions can lead to prolonged stress, which can consequently lead to burnout syndrome (Ferreira & Brandão, 2012). Finally, regarding practical implications, sports psychologists should keep in mind the impact of emotions and focus on promoting feelings of happiness and excitement in referees, by training referees in the way they deal with emotions and teaching them strategies to regulate their emotions' intensity and to help them interpret the effects of emotions on their performance.

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