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The Effect of Cognitive Appraisal on Teachers' Mental Health: A Multi-Group Analysis

El efecto de la evaluación cognitiva en la salud mental de los docentes: un análisis multigrupo

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Abstract
Teaching is a demanding activity and occupational stress has been considered a relevant health problem related to teacher's mental health. This study sought to analyse the specific relations between cognitive appraisal and psychological distress, and if that relationship was moderated by gender. A cross-sectional study was conducted in 402 basic and secondary schoolteachers. The evaluation protocol included a Demographic Questionnaire, the Primary and Secondary Cognitive Appraisal Scale, and the General Health Questionnaire-12. Structural equation modelling with multigroup analysis was performed to test the hypothesis. Clinical cases of psychological distress in teachers were prevalent (87%). Male teachers assumed a significant worse psychological profile, showing more clinical symptoms of anxiety/depression than female teachers do. Significant main effects for gender were found for challenge perception and coping potential with males assuming more coping potential and females assuming more challenge perception. Threat perception was the strongest predictor of teachers' mental health. Threat perception and psychological distress, was stronger in males, and challenge perception predicted psychological distress only in males. Work

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organizations must implement occupational strategies that promote a more positive cognitive appraisal of work.

Keywords: Teachers, Cognitive appraisal, Psychological distress, Gender

Resumen

La docencia es una actividad exigente y el estrés laboral se ha considerado un problema relevante para la salud mental del docente. Este estudio buscó analizar las relaciones específicas entre la valoración cognitiva y la angustia psicológica, y si esa relación estaba moderada por el género. Se realizó un estudio transversal en 402 profesores de educación básica y secundaria. El protocolo de evaluación incluyó un cuestionario demográfico, la escala de valoración cognitiva primaria y secundaria y el cuestionario de salud general-12. Se realizó un modelado de ecuaciones estructurales con análisis multigrupo para probar la hipótesis. Los casos clínicos de malestar psicológico en los profesores fueron prevalentes (87%). Los profesores varones asumieron un perfil psicológico significativamente peor, mostrando más síntomas clínicos de ansiedad / depresión que las profesoras. Se encontraron efectos principales significativos para el género en la percepción del desafío y el potencial de afrontamiento, ya que los hombres asumieron más potencial de afrontamiento y las mujeres asumieron una mayor percepción del desafío. La percepción de amenazas fue el predictor más fuerte de la salud mental de los profesores. La percepción de la amenaza y la angustia psicológica fue más fuerte en los hombres, y la percepción de desafío predijo angustia psicológica solo en los varones. Las organizaciones laborales deben implementar estrategias ocupacionales que promuevan una valoración cognitiva más positiva del trabajo.

Palabras clave: Docentes, valoración cognitiva, malestar psicológico, género.

INTRODUCTION

Stress is frequently presented as a process by which environmental factors may lead to an internal state of arousal and displeasure (Catano *et al.,* 2010). Occupational stress may be defined as an undesirable reaction, experienced when excessive pressure or/and work demands are placed on workers and perceived as exceeding their abilities and resources to cope (Cooper & Cartwright, 1994; Lazarus, 1991; Lazarus & Folkman, 1984). This process contributes to organizational inefficiency, staff turnover, absenteeism, and decreased job satisfaction (AbuAlRub, 2004; Arnetz, 2006; Avey, Luthans, & Jensen, 2009; Darr & Johns, 2008). The UK Health and Safety Executive advanced that in 2015/16, work-related stress, depression or anxiety accounted for 37% of all work-related issues and 45% of all working days lost due to ill health, totalising 11.7 million days lost (Health and Safety Executive, 2016).

Education is a demanding activity that induces higher levels of stress, on par with other public service industries (Health and Safety Executive, 2016). The issue of stress in teachers has been risen by influential work of Kyriacou and Sutcliffe (1977). The authors proposed a model that conceptualized teacher stress as a response syndrome mediated by threat appraisal and that coping mechanisms can act as mechanisms to reduce the perceived threat (Kyriacou & Sutcliffe, 1978). The impact of teacher stress on psychosocial wellbeing is well documented in the literature (Borg, Riding, & Falzon, 1991; Catano *et al.,* 2010; Kourmousi & Alexopoulos, 2016); however, the process underlying the development of occupational stress must be addressed to provide insights on human adaptation to work conditions and stress in schoolteachers.

One of such mechanisms is cognitive appraisal, which is crucial to understand human adaptation to stress and is based in the premise that stressful experiences are dependent on the individual evaluation of the relevance of a potentially stressful event for the wellbeing (Lazarus & Folkman, 1984). The transactional model proposed by Lazarus (1991) suggests that two processes of cognitive appraisal are essential to understand this relationship: primary and secondary cognitive appraisal. Primary cognitive appraisal relates to the individual evaluation of the stressful situation and secondary cognitive appraisal relates to the coping ability of the individual to deal with the situation; these two cognitive factors are central to understand human adaptation to stress. The result of primary cognitive appraisal is either a feeling of challenge (if the individual believes that can deal with the event) or threat (if the individual believes that will not be effective when dealing with the event). Primary cognitive appraisal is complemented with the secondary cognitive appraisal, which analyses the individual belief whether the resources or specific skills available are adequate to deal with the stressful event. Research findings on how cognitive appraisal affects adaptation to stressful events are scarce (Gomes, Faria, & Gonçalves, 2013; Gomes, Faria, & Lopes, 2016; Ohly & Fritz, 2010; Paškvan, Kubicek, Prem, & Korunka, 2016), especially in schoolteachers.

Since the work of Kyriacou and Sutcliffe (1977), a large number of papers have been published focussing in analysing teachers sources of stress and even in reactions to occupational stressors, at individual, family, and organizational levels (Ilies *et al.,* 2015; Shirom, Oliver, & Stein, 2009, 2010). However, by considering the most widely used databases (Pubmed, Scopus, Web of Science and EBSCO platform) few studies (in any) have addressed the specific relations between those two processes of cognitive appraisal and teacher's mental health (e.g., Gomes *et al.,* 2013). In order to test these relations, two hypotheses were established.

Hypothesis 1: We expect that challenge perception relate negatively with psychological distress and threat perception relate positively with psychological distress; also, we expect that both coping potential and control perception relate negatively with psychological distress.

Although empirical findings are scarce regarding these specific relations, literature suggests the significant impact of cognitive appraisal on human functioning. For example, in a study analysing the experience of stress and teachers' burnout - a risk factor for psychological distress (Gluschkoff *et al.,* 2016; Iancu *et al.,* 2018) - Gomes and colleagues (2013) found that primary cognitive appraisal was positively (threat perception) and negatively (challenge perception) related to burnout. In addition, the authors found that secondary cognitive appraisal (coping potential and control perception) was negatively related to burnout. Even in the same domain, but in a study with health professionals, Simães, Gomes & Costa (2019) found that primary and secondary cognitive appraisal variables constituted relevant predictors of nurses' psychological distress. Thus, considering existing findings, we expect that cognitive appraisal over work present a significant effect on teachers' mental health (i.e., psychological distress).

Hypothesis 2: We expect that relations between cognitive appraisal and teacher's mental health will be moderated by gender. In fact, substantial indications from literature supports that gender plays a major role explaining how individuals adapt to work conditions. Research regarding the socio-cognitive perspective on gender differences in health, highlight that women have a longer life expectancy compare to men, but they are more affected by stressors and more prone to experience psychological morbidity (e.g., anxiety and depression) (Mayor, 2015). Moreover, Mayor (2015) also suggests that gender differences, in terms of stress responses and cognitive appraisal processes, are explained by gender roles and traits (masculinity and femininity. For example, in a study with nurses – a highly "female profession"- Simães and Gomes (2019) found that female nurses presented significant levels of anxiety/depression and social dysfunction, deserving for clinical attention, in comparison to male nurses. Regarding the education activity, teaching has been considered a profession associated to typically female characteristics (Garcia-Arroyo, Segovia, & Peiro, 2019), and compared to other professionals (e.g., nurses), teachers have been found to experience more occupational stress and health-related problems, as burnout (Gluschkoff *et al.,* 2016). In this field, a in a recent meta-analytical review (Garcia-Arroyo *et al.,* 2019), the authors found that gender was negatively significant for teachers' personal accomplishment and gender egalitarianism explained variations in burnout. These findings reinforce the idea that gender inequalities may impact the way stress is perceived and coped (Mayor, 2015). Thus, in the face of the evidence, we expect that the relationship between cognitive appraisal and psychological distress will be different among female and male teachers.

Considering these aspects, we establish two main goals for this study:

(a) Analyse the specific relations between cognitive appraisal and psychological distress.

(b) Analyse if gender moderates the relationship between cognitive appraisal and psychological distress.

METHOD

Participants

We conducted a cross-sectional study in 402 basic and secondary schoolteachers from 23 school groupings from the northern region of Portugal, integrated in the teaching system regulated by the Portuguese Ministry of Education and Science. The sample consisted of 113 males (28%) and 289 females (72%) with ages varying between 28 and 67 years (M = 47.04, SD = 7.69). Most the respondents (83%) had more than 15 years of professional experience (M = 22.57, SD = 8.14), and a permanent contract position at the school (54%).

Measures

Demographic Questionnaire. The questionnaire evaluated personal (e.g., gender, age, marital status) and professional (e.g., years of work, teaching level, weekly teaching hours) characteristics of participants.

Primary and Secondary Cognitive Appraisal Scale (PSCAS). The cognitive appraisal scale (Gomes & Teixeira, 2014) assessed primary and secondary processes of cognitive appraisal. Three dimensions assessed primary cognitive appraisal: (1) work importance (e.g., "My job… means nothing to me/means a lot to me"); (2) threat perception (e.g., "My job… is not disturbing to me/is disturbing to me"); and (3) challenge perception (e.g., "My job… is not exciting for me/is exciting for me"). Secondary appraisal was assessed with two dimensions: (4) coping potential (e.g., "To what extent do you think you are prepared to handle the demands of your job?"); and (5) control perception (e.g., "To what extent do you feel that what happens in your job depends on you?"). All items were measured on a seven-point Likert scale and the coding of each response was adapted for each question (e.g., 0 = Not at all important to me; 6 = Very important to me for work importance; 0 = Not at all prepared; 6 = Well prepared for coping potential). For each dimension, the score was obtained by summing each item value and dividing the result by the number of items in the scale. High scores on each scale indicated higher perception of work importance, threat and challenge perceptions, coping potential and control perception.

General Health Questionnaire-12 (GHQ-12). This self-report instrument (Goldberg, 1972; Goldberg & Williams, 1988) is a widely used measure of general psychological health and a Portuguese version has been previously developed (McIntyre, McIntyre, & Redondo, 1999). The instrument evaluates changes in affective and somatic symptoms relative to usual levels of health (e.g., Have you recently been able to enjoy your normal day-to-day activities?). The version used in this study contains 12 items, and the responses were measured using a dichotomous scale (0-0-1-1) and a cut-off point of 3+ symptoms reported, widely accepted as a sign of mental health morbidity (Chipimo & Fylkesnes, 2010; Goldberg & Williams, 1988; Mario *et al.,* 2002). The global score of the GHQ-12

can be calculated summing the values of the 12 items and higher scores indicate worse mental health status (Baumann *et al.,* 2008). The scores for the anxiety/depression and social dysfunction subscales were also considered.

Procedures

The study was approved by the Ethics Committee of the authors' university (ref. SECSH 003/2015) and conformed to both national and European regulation concerning human research and management of personal data. After the approval, the directors of the executive council of each school were contacted, and the main goals and the research methodology were explained. Subsequently, the research instruments ——consisting of a demographic questionnaire, the Primary and Secondary Cognitive Appraisal Scale, and the General Health Questionnaire-12— were given to the teachers with an explanation text and a written consent form attached, to ensure that participants understood the goals and the voluntary nature of their participation.

Data Analysis

Data analysis was conducted using Statistical Package for the Social Sciences (SPSS) and Analysis of Moment Structures (AMOS), versions 25 (IBM, SPSS Inc., Chicago, IL).

Data was screened to identify missing data and participants who attributed low importance to work activity. Appraising a given situation (i.e., work activity) as significant and personally relevant is essential to emotionally react and adapt to stressful situations (Gomes, 2014; Gomes, Simães & Dias, 2017). Thus, the mediating role of cognitive appraisal was tested in participants who attributed some importance to work. Initially the sample consisted of 482 participants, but one participant was excluded for selecting values less than or equal to two points on the Likert scale of the work importance dimension of the PSCAS. Seventy-two participants were excluded for not having responded to one or both instruments or answering the same response in the GHQ-12. This instrument has reverse-worded items and choosing the same option in all questions reveals issues with data quality. Six participants were excluded for not having responded to the demographic questionnaire regarding the variable "gender", used for multigroup analysis and, after screening to detect univariate and multivariate outliers through visual inspection of data distribution, skewness and kurtosis, Z-scores and Mahalanobis distance (Tabachnick & Fidell, 2013), one participant was excluded resulting in a final sample of 402 participants. According to Tabachnick and Fidell (2013) when few data points are missing randomly, different methods for handling missing values will return similar results. We had 27 variables with missing values (26 with less than 5% and 1 with less than 8%) in a random pattern and

values were replaced by the mean in continuous variables and by the median in ordinal variables.

Confirmatory factor analysis was performed to test the factorial validity of the instruments. Validity and reliability of the instruments (PSCAS and GHQ-12) was assessed through composite reliability (CR), maximal reliability, average variance extracted (AVE) and the square root of the average variance extracted. Configural and metric invariance tests were conducted for both PSCAS and GHQ-12 instruments. configural invariance tests were performed analysing a freely estimated model across gender groups. Metric invariance tests were conducted testing for differences in $\chi 2$ values between unconstrained and fully constrained models (Byrne, 2004), and assessing differences in CFI values between the models. Differences in CFI are not affected by sample size and therefore may be more robust for testing between-group invariance (Cheung & Rensvold, 2002).

The structural model, to test the relationship between cognitive appraisal and psychological distress, was tested for multivariate assumptions (e.g., outliers, influential and multicollinearity through linear regression, with psychological health variables as dependant variables and cognitive appraisal variables as independent variables, analysing cook's distance, variable inflation factor and tolerance values and no outlier, influential or multicollinearity problems were detected) (Tabachnick & Fidell, 2013).

The Chi-square test was used to assess the association between gender and the presence of clinical symptoms of psychological distress (i.e., scoring ≥ 3 in the GHQ-Total). To assess eventual gender differences in cognitive appraisal, a one-way multivariate analysis of variance (MANOVA) was conducted with gender as fixed factor and all PSCAS scores as dependant variables.

To perform the multigroup analysis, gender was used to create two groups. configural and metric invariance tests were conducted, and fit properties were analysed. Differences in structural path coefficients were tested through Z-score testing. To assess model fit, $\chi 2$ goodness-of-fit statistic, the $\chi 2/df$, the root mean square error of approximation (RMSEA) and its 90% confidence interval, the standardized root mean squared residual (SRMR), the Tucker–Lewis index (TLI), the normed fit index (NFI) and the comparative fit index (CFI) were used. The cut-off values for model fit acceptance used, in this study, followed generally accepted indices in previously published literature, namely: RMSEA values < .08 (Schumacker & Lomax, 2016); SRMR values < .08 (Hu & Bentler, 1999); TLI values close to .90 or .95 (Schumacker & Lomax, 2016); NFI values close to .90 or .95 (Schumacker & Lomax, 2016); and CFI values close to .95 (Hu & Bentler, 1999).

Bootstrapping was performed (1000 samples) to obtain 95% bias-corrected confidence intervals around the parameter estimates (MacKinnon, Fairchild, & Fritz, 2007).

RESULTS

Confirmatory Factor Analysis

PSCAS. Confirmatory factor analysis revealed that the five-factor model structure fitted well with the data ($\chi2(80\ df) = 125.657$, $p = .001$; $\chi2/df = 1.571$; RMSEA = .038, 90% CI [.024, .050]; CFI = .985; NFI = .959; TLI = .980). The values of average variance extracted ($.6 \leq AVE \leq .7$) suggest convergent validity and the values of composite reliability ($.8 \leq CR \leq .9$) suggest good reliability. Discriminant validity is evidenced by the square root of the average variance extracted being greater than any inter-factor correlation. Configural invariance tests were conducted for gender and obtained adequate goodness-of-fit when analysing a freely estimated model across groups of males/females (RMSEA = .032, 90% CI [.022, .041]; SRMR = .0577; CFI = .978). Metrical invariance tests were also conducted testing for differences in $\chi2$ and CFI values between unconstrained and fully constrained models. For gender ($\Delta\chi2(15) = 18.1$, $p = .257$; $\Delta CFI = -.001$) nonsignificant $\chi2$ difference test and ΔCFI values indicate that the models were configural and metrically invariant.

GHQ-12. In this study, a second-order factor model with two first order factors was implemented. Confirmatory factor analysis revealed that the two-factor model structure fitted acceptably with the data ($\chi2(53\ df) = 197.591$, $p < .001$; $\chi2/df = 3.728$; RMSEA = .082, 90% CI [.070, .095]; CFI = .916; NFI = .890; TLI = .896). After correlating the errors with higher modification indices, the fit measures improved ($\chi2(52\ df) = 158.155$, $p < .001$; $\chi2/df = 3.041$; RMSEA = .071, 90% CI [.059, .084]; CFI = .939; NFI = .912; TLI = .922). The errors that were correlated were the errors of items 10 and 11 of the Anxiety/Depression factor whose similarities in formulation justify this procedure. The value of average variance extracted (.5) and composite reliability (.7) suggest acceptable convergent validity and reliability. Configural invariance tests were conducted for gender. Adequate goodness-of-fit when analysing a freely estimated model across groups of males/females (RMSEA = .056, 90% CI [.047, .066]; SRMR = .0644; CFI = .924) were obtained. Metrical invariance was also assessed, testing for differences in $\chi2$ and CFI values between unconstrained and fully constrained models. For gender ($\Delta\chi2(10) = 6.904$, $p = .734$; $\Delta CFI = .002$) nonsignificant $\chi2$ difference test and ΔCFI values indicate that the models were invariant, both configural and metrically speaking.

Descriptive Statistics and Correlations for Cognitive Appraisal and Mental Health

The means, standard deviations, Spearman correlations and alpha values are presented in Table 1 for the total sample.

Table 1.

Means (M), standard deviations (SD), correlation coefficients between PSCAS and GHQ-12 items and alpha values in the total sample (N = 395)

Variables	*M* (*SD*)	1	2	3	4	5	6	7
1. PSCAS Threat Perception	2.32 (1.28)	(.80)						
2. PSCAS Challenge Perception	4.32 (1.11)	-.34***	(.87)					
3. PSCAS Coping Potential	4.79 (.78)	-.34***	.43***	(.85)				
4. PSCAS Control Perception	4.09 (.90)	-.26***	.39***	.46***	(.77)			
5. GHQ-Global Score	6.22 (2.90)	.32***	-.25***	-.23***	-.26***	(.84)		
6. GHQ-Anxiety/ Depression	4.40 (1.98)	.14**	-.07	-.07	-.10*	.71***	(.86)	
7. GHQ-Social Dysfunction	1.83 (1.81)	.34***	-.30***	-.27***	-.30***	.78***	.18***	(.78)

Note. Alpha values are presented in parentheses on the diagonal.

**p < .05. **p < .01. ***p < .001.*

Alpha values suggest acceptable reliability between the items of each dimension of the PSCAS and GHQ-12. Considering that gender will be used in the multigroup analysis, the means, standard deviations and Spearman correlation coefficients for each group are presented in Table 2.

Table 2.

Means (M), standard deviations (SD) and correlation coefficients between PSCAS and GHQ-12 items in Males (n = 113) and Females (n = 289)

Variables	1	2	3	4	5	6	7	*M (SD)*[b]
1. PSCAS Threat Perception	-	-.35***	-.37***	-.24***	.28***	.13*	.31***	2.38 (1.30)
2. PSCAS Challenge Perception	-.35***	-	.42***	.38***	-.21***	-.03	-.30***	4.40 (1.10)
3. PSCAS Coping Potential	-.26**	.50***	-	.53***	-.26***	-.09	-.28***	4.74 (.78)

Variables	**1**	**2**	**3**	**4**	**5**	**6**	**7**	***M (SD)*[b]**
4. PSCAS Control Perception	-.30**	.42***	.31**	-	-.27***	-.09	-.32***	4.08 (.86)
5. GHQ-Global Score	.42***	-.33***	-.17	-.26**	-	.72***	.77***	6.13 (2.97)
6. GHQ-Anxiety/ Depression	.18	-.15	-.02	-.14	.67***	-	.18**	4.27 (2.06)
7. GHQ-Social Dysfunction	.41***	-.34***	-.23*	-.27**	.82***	.20*	-	1.86 (1.82)
M (*SD*)[a]	2.17 (1.24)	4.14 (1.13)	4.94 (.79)	4.12 (.97)	6.45 (2.72)	4.71 (1.73)	1.74 (1.80)	

Note. [a] Males; [b] Females. Correlation matrix for Males is below the diagonal and for Females is above the diagonal.
**p < .05. **p < .01. ***p < .001.*

The correlations between threat perception and the GHQ-12 variables were positive and significant for the total sample, but not always significant with the dimension anxiety/depression in males. The correlations between the GHQ-12 variables and challenge perception and coping potential were negative but not significant with the dimension anxiety/depression for the total sample, but the association between the GHQ-12 variables and control perception was negative and significant. When considering the different subgroups, this trend continued and the association between challenge perception, coping potential and control perception and the dimension anxiety/depression was not significant. In males, the association between the GHQ-global score and coping potential was also not significant.

Considering the GHQ-global score, 87.1% of the participants scored 3 or more. Both male and female groups revealed a mean GHQ-global score > 3, ranging from 6.13 (SD = 2.97) in the group of females to 6.45 (SD = 2.72) in the male group. Analysing both GHQ subscales, 80.3% of the participants scored 3 or more in the Anxiety/Depression subscale and 30.1% scored 3 or more in the Social Dysfunction subscale. All subgroups revealed mean Social Dysfunction score < 3 and mean Anxiety/Depression Score > 3, the latter ranging between 4.27 (SD = 2.06) in the female group and 4.71 (SD = 1.73) in the male group. We found a significant association between gender and scoring > 3 in the Anxiety/Depression (87.6% males vs. 77.5% females; $\chi 2 = 5.250$, $p = .025$).

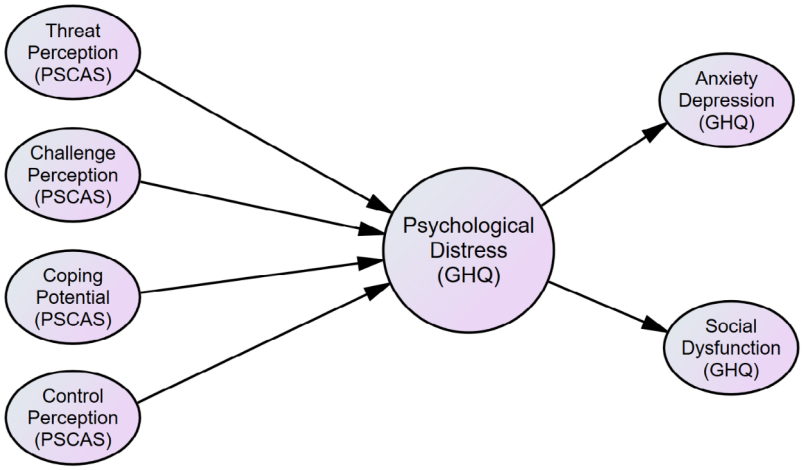
In the PSCAS, the factor that presented lower scores was Threat Perception with mean score ranging from 2.17 (SD = 1.24) in males to 2.37 (SD = 1.30) in females. Coping potential was the factor that scored highest, with mean score ranging between 4.74 (SD = .78) in the female group and 4.94 (SD = .79) in the male group.

Cognitive Appraisal and Psychological Health: Theoretical and Multigroup Model

The proposed model to study the relationship between cognitive appraisal and mental health of schoolteachers is represented in Figure 1.

Figure 1.

Theoretical Model of the Relationship between Cognitive Appraisal and Mental Health in Schoolteachers.



The proposed model (Figure 1) fitted well to the data corresponding to the total sample evidencing good overall model fit ($\chi2(239\ df) = 420.798$, $p < .001$; $\chi2/df = 1.761$; RMSEA = .044, 90% CI [.037, .050]; SRMR = .0505; CFI = .956; NFI = .905; TLI = .949). The path analysis between the factors revealed that the path 'Threat Perception' → 'Psychological Distress' is the one with higher regression weight ($\beta = .291$; $z = 4.029$; $p < .001$; 95% CI = [.128, .460]) and is positively linked with psychological distress. The path 'Control Perception' → 'Psychological Distress' was also significant ($\beta = -.234$; $z = -2.877$; $p = .004$; 95% CI = [-.378, -.078]) but negatively linked with psychological distress. The paths 'Challenge Perception' → 'Psychological Distress' ($\beta = -.137$; $z = -1.884$; $p = .060$; 95% CI = [-.295, .003]) and 'Coping Potential' → 'Psychological Distress' ($\beta = .005$; $z = .067$; $p = .946$; 95% CI = [-.175, .209]) were not significant predictors of psychological distress.

Gender differences in Cognitive Appraisal

The one-way MANOVA revealed a significant multivariate main effect for gender, Wilk's $\lambda = .950$, $F(4,397) = 5.203$, $p < .001$, partial eta squared = .050, power to detect the effect was .968. Given the significance of the overall test, the univariate main effects of gender on the PSCAS factor scores were examined and summarized in Table 3.

Table 3.

Means and standard deviations for PSCAS and MANOVA results on the effects of gender on the PSCAS factor scores, F, p-value and partial eta squared (η^2).

PSCA	Males	Females	*F*	*p-values*	η^2
Threat Perception	2.17 (1.24)	2.38 (1.30)	2.014	.157	.005
Challenge Perception	4.14 (1.13)	4.40 (1.10)	4.500	.035	.011
Coping Potential	4.94 (.79)	4.74 (.78)	5.003	.026	.012
Control Perception	4.12 (.97)	4.08 (.86)	.193	.661	< .001

Significant univariate main effects for gender were obtained for challenge perception and coping potential with males evidencing higher scores of coping potential and females evidencing higher scores of challenge perception.

Model fit indices for the multigroup model (males vs. females) were $\chi2(478 \text{ df}) = 743.895$, $p < .001$; $\chi2/df = 1.556$; RMSEA = .037, 90% CI [.032, .042]; SRMR = .0684; CFI = .938; NFI = .846; TLI = .928, suggesting acceptable fit to the data and evidencing the configural invariance of the proposed model, as adequate goodness-of-fit when analysing a freely estimated model across groups of males/females were obtained. To test for metric invariance, $\Delta\chi2$ and ΔCFI values, between the unconstrained model and the model with constrained measurement weights, were calculated and the results are shown in Table 4.

Table 4.

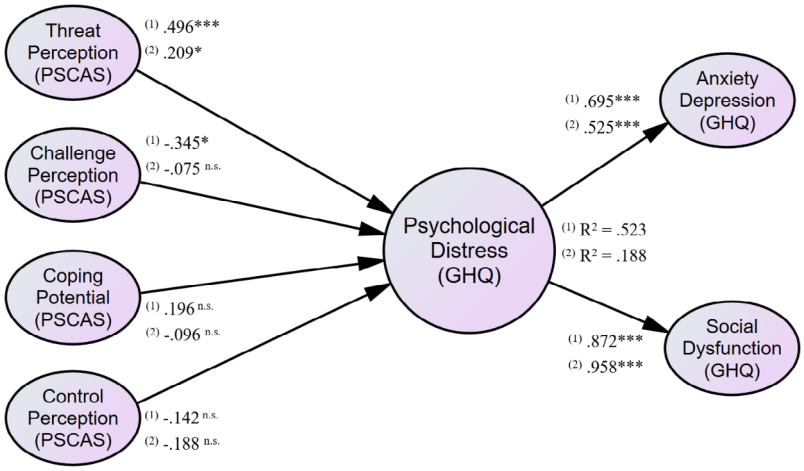
Assessment of invariance across multigroup analysis (gender).

	Model	$\chi^2(df)$	CFI	$\Delta\chi^2(df)$, *p-value*	ΔCFI
Males vs. Females	Unconstrained	743.895 (478)	.938	12.91 (18), $p = .796$	.001
	Constrained	756.816 (496)	.939		

These results demonstrate that the proposed model to test the relationship between cognitive appraisal and mental health is metrically invariant regarding gender. The model for the relationship between cognitive appraisal and mental health with corresponding standardized regression weights for males and females is represented in Figure 2.

Figure 2.

Structural Model for the relationship between Cognitive Appraisal and Mental Health. Multigroup analysis for gender (Males [(1)] vs. Females [(2)]).



*[n.s.] p > . 50. * p < .05. ** p < .01. *** p < .001.*

Threat perception was a significant predictor of psychological distress in both male and female schoolteachers; however, challenge perception was only a significant predictor in males. Using the regression weights and critical ratios for differences in AMOS, differences in the structural path coefficients were tested. The Z-test, hypothesizing that the relationship for the path 'Threat Perception' → 'Psychological Distress' in males (β = .496, p < .001) was stronger than in females (β = .209, p < .013) revealed significant (Z = -1.824, p = .034). The explained variance for general psychological distress and anxiety/depression was higher in males than in females but social dysfunction was higher in females than in males (Table 5).

Table 5. Explained Variance for Psychological Distress, Anxiety/Depression and Social Dysfunction by the Predictive Model in Each Group of Variables.

Groups	**Psychological Distress** R^2 **(95% CI)**	**Anxiety/Depression** R^2 **(95% CI)**	**Social Dysfunction** R^2 **(95% CI)**
Males	.522 (.228, .801)	.485 (.148, .842)	.752 (.380, .1.182)
Females	.195 (.050, .365)	.268 (.080, .582)	.911 (.517, 2.103)

DISCUSSION

Considering the role of cognitive appraisal in the process of human adaptation to work (Gomes *et al.,* 2017), we investigated the relationship between work cognitive appraisal and

psychological distress in schoolteachers, and whether that relationship would be moderated by gender. To do so we tested two main hypotheses.

Regarding the first hypothesis, we expected that work cognitive appraisal presented a significant effect on teachers' mental health (i.e., psychological distress). The hypothesis was confirmed for the relationship paths between threat and control perceptions, respectively with teachers' psychological distress; but not for the relationship paths between challenge perception and coping potential, respectively with psychological distress. In detail, threat perception constituted the strongest predictor of teachers' mental health, in such a way that higher threat perception over work was related to more negative feelings of psychological distress. In this study, in spite of the teachers' moderately low threat perception over work, the percentage of cases that deserved significant clinical attention, in terms of psychological distress, was fairly high (i.e., 87%), surpassing the results found in a study with registered nurses (Simães & Gomes, 2019). Thus, these are important findings for the educational context, since they highlight the need to consider both teachers' mental health and the way teachers evaluate their work, when defining educational management policies and occupational health programs. Furthermore, findings also suggest that control perception exerted independent significant effects on teachers' mental health – higher perception of control over work was related to reduce negative feelings of psychological distress. These effects were also found in a study with nurses (Simaes *et al.,* 2019), but in a recent study focusing on teachers' burnout (Reis, Gomes, & Simães, 2018) control perception did not predict mental health. Although that, believing that one can have control has been associated to outcomes that are more positive for teachers (Mearns & Cain, 2003).

Interesting to notice that, on the contrary of the transactional theory of stress (Lazarus, 1991; Lazarus & Folkman, 1984) and the interactive model of human adaptation to stress (Gomes, 2014; Gomes *et al.,* 2017), challenge perception did not predict teachers' mental health, nor did coping potential, which was fairly high in this sample of teachers. In fact, over the years, teachers have been facing several economic and organizational change, that have been resulting into a continuous amount of unexpected and new teaching demands (e.g., increasing number of tasks - in and outside the school; pressure for excellency of performance; students misbehaviours; and precariousness of work contracts) (Gluschkoff *et al.,* 2016; Iancu *et al.,* 2018; Shirom *et al.,* 2010). These characteristics of work intensification have been related to employees' wellbeing, several negative work outcomes, and an urgent need to develop and learn coping strategies (Mearns & Cain, 2003; Paškvan *et al.,* 2016). Thus, it may not appear so strange that teachers evaluated their work as threatening and simultaneously perceived high level of coping resources, because the overall work's circumstances forced them to develop those resources. However, for teachers, in spite of perceiving high coping potential, not all the demands might be appraised as controllable. These results suggest that educational organizations (e.g., principals) should implement work

strategies that make the educational environment less threatening and more controllable for teachers —as by implementing a favourable participative climate (Paškvan et al., 2016)— in order to assure and promote teachers' mental health, which is known to influence their work performance and students' academic success (Iancu *et al.,* 2018).

Regarding the second hypothesis, we expected that the relationship between cognitive appraisal and psychological distress would be different among female and male teachers, since differences in cognitive appraisal were expected between males and females. The results of the one-way MANOVA evidenced a multivariate main effect of gender on the cognitive appraisal factor scores. Differences were found in challenge perception and coping potential with females showing higher scores of challenge perception and males showing higher scores of coping potential. These are interesting findings, since challenge appraisals occur when individuals evaluate the situation as potential benefit and perceive enough resources to face the encounter (Lazarus & Folkman, 1984) which have been related to more positive health outcomes and overall human functioning (Gomes *et al.,* 2017; Lazarus, 1999). In fact, in this study, we found a significant association between gender and the experience of anxiety/depression, with female teachers showing a lower percentage of clinical cases, in comparison to male teachers. Furthermore, although reporting more coping resources, male teachers evidenced a worst psychological profile, assuming higher levels of clinical symptoms of anxiety/depression than women. This is an unusual finding, since there is evidence that women are generally more affected by stressors and vulnerable to the experience of mental health problems (e.g., anxiety and depression; psychological distress) (Drapeau, Marchand, & Forest, 2014; Mayor, 2015).

Even though, the second hypothesis was not confirmed. Gender was expected to moderate the relationship between cognitive appraisal and psychological distress, but the findings demonstrated the invariance of the structural model regarding gender. Regardless, we observed significant differences in the path "Threat Perception' → Psychological Distress", with a stronger relationship in males, and challenge perception predicted psychological distress only in males. Once more, these results constitute a novel finding, as research has been showing that women experience more chronic stressors than men, and consider stressors more threatening (Lazarus & Folkman, 1984; Mayor, 2015). On the opposite, in this sample, male teachers seem to be at a higher risk of experience psychological distress, related to the way they evaluate the work environment, suggesting that man, in spite of perceiving more coping resources than women perceive, evidence more difficulties in adapting to the teaching profession a considered typically female profession (Garcia-Arroyo *et al.,* 2019). Therefore, work organizations must give special thought not only to teachers in general, but particularly to male teachers, implementing occupational strategies that promote a more positive cognitive appraisal of work reducing the perception of threat

and increasing the perception of teaching as a challenge. It is also important to stimulate teachers how to use their coping resources and have control over their work.

Granting the relevance of the findings, the study faces some limitations, as it was cross-sectional, so the results should be confirmed in the future by longitudinal designs. The percentage of male teachers was inferior to that of female, but no differences were found regarding group representativeness in the population. Findings based on self-reports might be affected by the individuals' capacity to report health data, however to some authors (e.g., Mayor, 2015), for chronic conditions, women and man are equally accurate at reporting health information. Moreover, considering that seventy-two participants were excluded for not having responded to the one or more instruments, it is unclear whether this attrition affects the generalizability of the results.

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Data Availability Statement

Research data are not shared.

Disclosure statement

The authors have no conflict of interest do disclose.

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