

Citing this paper:

Simões, C., Rodrigues, J., Gonçalves, A.M., Faria, S., & Gomes, A.R. (2021). Work–family conflicts, cognitive appraisal, and burnout: Testing the mediation effect with structural equation modelling. *British Journal of Educational Psychology*, 91(4), 1349-1368. <https://doi.org/10.1111/bjep.12420>

Work-family conflicts, cognitive appraisal, and burnout: Testing the mediation effect with structural equation modelling

Clara Simões*¹, Jéssica Rodrigues², A. Manuela Gonçalves³, Susana Faria³, and A. Rui Gomes⁴

¹ School of Nursing | Research Unit: UICISA: E/ESEnfC (NUMinho).

² University of Minho, Department of Mathematics and Applications. Portugal.

⁴ University of Minho, Centre of Mathematics, Department of Mathematics and Applications. Portugal.

⁵ University of Minho, School of Psychology. Portugal.

***Corresponding author:** Clara Simões, Universidade do Minho, Escola Superior de Enfermagem, Campus de Gualtar, 4710-057 Braga, Portugal (e-mail: csimaes@ese.uminho.pt).

Acknowledgements.

This study was conducted at the Psychology Research Centre (PSI/01662), School of Psychology, University of Minho, and supported by the Portuguese Foundation for Science and Technology and the Portuguese Ministry of Science, Technology and Higher Education (UID/PSI/01662/2019), through the national funds (PIDDAC).

The authors have no conflicts of interest to report.

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Work-family conflict constitutes an important source of occupational stress predicting teachers' burnout, and cognitive variables have shown to be core structures in explaining human adaptation to stress. Nevertheless, the role of cognitive appraisal needs to be fully analysed to comprehend how it can mediate the relationship between stress and burnout. In order to understand the potential mediation of cognitive appraisal in the relationship between stress and burnout, we adopted conceptual models of stress that highlighted the value of cognitive appraisal on positive and negative reactions to work demands. Also, we analysed the potential moderation of sex and age in the relationship between work-family conflict, cognitive appraisal, and burnout due inconsistent findings on how these personal variables can interfere on these relations. In this study, we used Structural Equation Modelling (SEM) to test the mediating of cognitive appraisal in the relationship between work-family conflicts and burnout. A survey with measures of work-family conflicts, cognitive appraisal, and burnout was administered to the participants consisting of 438 Portuguese teachers from kindergarten through high school, aged between 28 and 67 years ($M = 46.85$; $SD = 7.88$), 304 of whom were females (69.41%). The results confirmed that cognitive appraisal partially mediated the relationship between work-family conflict and burnout. The mediation effect of cognitive appraisal on the relationship between work-family conflict and burnout was invariant regardless of teachers' sex or age. In sum, cognitive appraisal should be considered in order to understand teachers' adaptation to work.

Keywords: teachers; burnout; cognitive appraisal; work-family conflicts; structural equation modelling.

Work-Family Conflicts, Cognitive Appraisal, and Burnout: Testing the Mediation Effect with Structural Equation Modelling

The teaching profession has been affected by several economic and structural changes in the past few years, making these professionals highly vulnerable to the experience of occupational stress and burnout (Gomes, Faria, & Gonçalves, 2013). Research demonstrates that burnout is correlated to low teacher job satisfaction, absenteeism, anxiety and depression, cardiovascular health problems, low quality of classroom instruction, reduced capacity of engagement with students, ineffective teaching, negative classroom climate, indiscipline, and low student academic achievement (Iancu, Rusu, Măroiu, Păcurar, & Maricuțoiu, 2018).

Teachers face increasing job demands and work under norms that expect them to continuously invest their emotional, cognitive, and physical energy (Garcia-Arroyo, Segovia, & Peiro, 2019; Shirom, 2003), resulting in work-family conflicts, chronic lack of control, and burnout (Iancu et al., 2018). Several sources of stress contribute to the experience of teacher burnout, such as excessive number of students in the classroom; poor dyadic teacher-student relationships; interpersonal conflicts with students, parents and colleagues; imbalance between teaching demands and teaching resources; work overload; lack of social support; management of students' problematic behaviours; low teacher salary; lack of professional recognition; collegial isolation; ambiguity of roles; and role conflicts (Garcia-Arroyo et al., 2019; Iancu et al., 2018). Particularly, stress related with interpersonal conflicts and work-family conflicts has been shown to highly impact the experience of teacher burnout, especially in women (Cinamon, Rich, & Westman, 2007; Rodriguez-Mantilla & Fernandez-Diaz, 2017; Záborská et al., 2018).

Work-family conflicts encompasses "Work-to-Family Conflict" (WFC) and "Family-to-Work Conflict" (FWC), two distinct but related constructs that can be understood as a type of role conflict that happens when the demands from one domain are incompatible with the demands of the other domain (Byron, 2005). Greenhaus and Beutell (1985) define Work-Family Conflict as "a form of interrole conflict in which the role pressures from the work and family domains are mutually incompatible in some respect. That is, participation in the work (or family) role is made more difficult by virtue of participation in the family (or work) role" (p. 77). Therefore, WFC occurs when the work domain interferes with the person's private life, and FWC occurs when family life interferes with the person's work domain (Byron, 2005; Netemeyer et al., 1996), thus

influencing the individual's personal satisfaction with work, professional relationships, family, and general life (Bellavia & Frone, 2005; Simões, McIntyre, & McIntyre, 2019).

Conflicts between work and family domains are a relevant source of occupational stress for many workers, namely for teachers (Glaser & Hecht, 2013; Piko & Mihalka, 2018; Turliuc & Buliga, 2014), leading to burnout in some cases (Cinamon et al., 2007; Záborská et al., 2018). However, not all individuals affected by work-family conflicts experience a negative adaptation or even burnout. As suggested by the transactional approach to stress (Lazarus & Folkman, 1984), the situation by itself does not determine the stress, but rather through the agency of individual perceptions (Gomes, Simões, & Dias, 2017). Thus, it is fundamental to determine how individuals appraise stress situations (primary cognitive appraisal) and their coping resources to deal with them (secondary cognitive appraisal) (Lazarus, 1991, 2006; Simões & Gomes, 2019).

There is evidence that cognitive variables are important structures to achieve a deeper understanding of the process linking work-family conflicts to burnout, but studies have been considering the separate effects of either primary cognitive appraisal (typically represented by threat and challenge cognitive appraisals) or secondary cognitive appraisal (typically represented by coping resources and control perceptions). For example, studies analysed the relations established between coping strategies and self-efficacy (Arvidsson et al., 2019; Turliuc & Buliga, 2014), while others analysed the relations between threat appraisals and self-efficacy (Glaser & Hecht, 2013). Thus, it is important to consider a full and joint understanding of the cognitive appraisal processes that underline the relationship between work-family conflicts and job burnout. Furthermore, to our knowledge, there is only evidence that threat appraisal mediates the relationship between work-family conflicts and emotional exhaustion (Glaser & Hecht, 2013). Therefore, in this study, we intend to achieve an integrated understanding of the relationships between work-family conflicts and teacher burnout by analysing the mediation effect of cognitive appraisal processes.

From a theoretical point of view, authors agree that cognitive appraisal is a pivotal variable to understand how exposure to work demands can produce different reactions in individuals. Specifically, Lazarus (1991) in the transactional model, Gomes (2014) in the interactive model, and Blascovich and Mendes (2000) in the biopsychosocial model, all defend that cognitive appraisal is central to understand reactions to stress, existing evidence that challenge states (i.e., evaluating work activity in a more positive way) typically evoke adaptive responses to stress, and threat states (i.e., evaluating work

activity in a more negative way) typically evokes a maladaptive response to stress (Kaltiainen, Lipponen, Fugate, & Vakola, 2020; Kim & Beehr, 2020).

As stated in the interactive model of human adaptation to stress (Gomes, 2014; Gomes et al., 2017), negative human functioning is expected to occur in individuals that appraise stress situations (in our case, work-family conflicts) more negatively (i.e., as threats to their personal well-being) in comparison to individuals that appraise stress situations as more positively (i.e., as challenges). Regarding secondary cognitive appraisal, individuals that perceive reduced control and lower coping resources over work-family conflicts are more likely to show negative human functioning at work in comparison to individuals that appraise to have higher control and coping resources over stress situations (Gomes et al., 2017).

Considering these aspects, authors suggest that cognitive appraisal occurs in a two-step process by triggering first primary cognitive appraisal (i.e., how individuals evaluate the source of stress) and then secondary cognitive appraisal (i.e., how individuals cope with the source of stress) (Gomes et al., 2017; Lazarus, 1991). These indications were translated to our study by testing both the direct relations of stress and cognitive appraisal on the consequent variable of burnout (see Figure 1) and by testing the mediation relation of cognitive appraisal (from primary appraisal to secondary appraisal) on the relation between stress and burnout (see Figure 2). This double option of testing allows establishing how adaptation to work occurs and how cognitive appraisal contributes to explain the complex relations between stress and consequences of stress (i.e., burnout).

Taken together all of these ideas, the main challenge to research about human adaptation to stress consists in giving indications about how antecedent factors (i.e., stress experiences) relate to consequent factors (i.e., reactions to the stress experience) and how cognitive appraisal interferes in this relation. Thus, in our study we define work-family conflicts as the antecedent variable, cognitive appraisal as the mediator variable, and burnout as the consequent variable (i.e., measure of adaptation to work). We selected burnout because little is known regarding how work-family conflicts lead to teacher burnout, and the role played by primary and secondary cognitive appraisals.

Burnout has been identified as a “prolonged response to chronic emotional and interpersonal stressors on the job” (Maslach, Schaufeli, & Leiter, 2001, p. 397). In our study, we assumed Shirom and Melamed (2006, p. 179) perspective of burnout, characterized by “the individuals’ feelings of physical, emotional and cognitive exhaustion”, focusing on the depletion of one’s energetic coping resources, in result of

chronic exposure to occupational stress. As so, burnout represents a combination of physical fatigue, emotional exhaustion, and cognitive weariness (Shirom, 2003, p. 250). This approach relies on Hobfoll's conservation of resources theory (Hobfoll, 1989), considering that human beings are naturally motivated to achieve, preserve, and defend their most valued resources. For teachers, family and work domains can be either viewed as important personal resources or significant sources of stress that restrict a proper work-family balance, or both instances. In this way, it can be supposed that both stressors of work-family conflict and family-work conflict may impose negative consequences to the teachers' well-being, leading to burnout. However, it is also possible that some teachers will not feel burnout in response to these stressors, because they may evaluate them in a different way, eventually as a challenge to their personal resources or as a threat to their personal functioning. This different pattern of evaluation may then influence their coping potential and control perception in managing the stressors, turning the reactions to stressors very different among teachers. Thus, considering the potential role of cognitive appraisal on the relationship between work-family conflicts and burnout, we established Hypothesis 1.

Hypothesis 1. Primary cognitive appraisal (i.e., threat perception and challenge perception) and secondary cognitive appraisal (i.e., coping potential and control perception) mediate the relationship between work-family conflicts and burnout.

Researchers have also dedicated substantial efforts to test differences between teachers on the experience of stress and burnout, most notably the role of sex and age. Regarding sex, research is not conclusive, suggesting that women, compared to men, are more prone to experience work-family conflicts and psychological problems (e.g., distress, depression, anxiety, burnout) (Arvidsson et al., 2019; Mayor, 2015; Seibt et al., 2013), while other studies point out that men suffer more often from burnout than women (Aparisi et al. 2019). However, there are also indications that men and women do not differ on the experience of burnout (Adekola, 2010; Buonomo, Fatigante, & Fiorilli, 2017; Henny, Anita, Hayati, & Rampal, 2014), while other researchers reported that women are more likely to experience higher levels of emotional exhaustion, and men are more likely to show a higher prevalence of depersonalization (Bilge, 2006; Lackritz, 2004).

Regarding the variable age, there are indications that younger teachers may experience higher levels of stress and burnout (Dicke et al., 2015; Harmsen, Helms-Lorenz, Ridwan, & Van Veen, 2019) arising from reduced professional satisfaction due

to contract instability, excessive hours of teaching, lower wage than older teachers, lack of supervisor support, among other factors (Fiorilli, Schneider, Buonomo, & Romano, 2019; Tümkaya, 2007). Nevertheless, there are also indications that age is positively related to increases of burnout, namely in the dimensions of emotional exhaustion and depersonalization (Aparisi et al., 2019). These inconsistent results are important to consider when testing the relationship between work-family conflicts, cognitive appraisal, and burnout, because they can contribute to clarifying whether these relations (theoretically established in our study) remain stable or dynamic according to the sex and age of teachers.

To the best of our knowledge, there are no indications on the moderation role of sex and age on the three variables tested in our study (stress, cognitive appraisal, and burnout). Thus, we can only guess that sex and age should not interfere on the relations between the three variables (i.e., the model will be invariant), because we expect that stress will have a relationship with burnout and that cognitive appraisal will mediate this relation despite the influence of participants' personal variables, as proposed by research dedicated to analysing adaptation to stress (Lazarus, 1991; Gomes, 2014). Considering these aspects, we established Hypothesis 2.

Hypothesis 2. The mediation effect of cognitive appraisal on the relationship between work-family conflicts and burnout is invariant regardless of teachers' sex or age.

In sum, this study established two hypotheses in order to test the relationships between work-family conflicts, cognitive appraisal, and burnout.

Methods

Participants

The total sample consisted of 438 Portuguese teachers from kindergarten through high school. Out of 438 teachers, 304 were female (69.41%), 129 males (29.45%), and five participants did not provide information on their sex. Their teaching experience ranged from two to 44 years ($M = 23.24$; $SD = 8.33$), and their ages ranged between 28 and 67 years old ($M = 46.85$; $SD = 7.88$). The majority of the participants were married (70.78%), 13.47% were single, 10.96% divorced, and 2.74% had another marital status (the remaining participants did not provide information about their marital status). Most teachers did not report sickness absence from work in the 12 months before the data collection (94.52%). Despite the unbalanced sample with respect to sex, this investigation had a distribution similar to that of the population of Portuguese teachers, with more

women than men choosing teaching as a career, which is also similar to the populations of the OECD countries (OECD, 2019, 2020).

Procedure

This study was approved by the Ethics Committee of the first author's university (ref. SECSH 003/2015), respecting the National and European regulations concerning research with humans and personal data protection. After obtaining consent from all ethical committees involved (i.e., University; Northern Regional Directorate of Education), we started by contacting the principals of each school to explain the aim of the study and to define the proceedings for data collection. We continued by contacting the school academic staff to invite them to participate in the study and to explain them the main goals. At this meeting, it was assured that participation was anonymous, confidential, and voluntary. The investigation protocol included self-reported measures, along with a voluntary written consent. All the participants interested in receiving information about the results of the study were asked to provide their names and email for further contact.

Measures

Sociodemographic Questionnaire

This questionnaire was built for the purpose of this study to assess the participants' personal (e.g., age, sex, marital status) and professional (e.g., years in the profession, professional category) characteristics.

The Work-Family Conflict & Family-Work Conflict Scales

The Work-Family Conflict & Family-Work Conflict Scales (WFC & FWC, Netemeyer et al., 1996; adapted by Simões, McIntyre, & McIntyre, 2009) evaluate work-family conflicts. The instrument includes 10 items distributed across the following two dimensions: (1) Work-Family Conflict Scale (WFC, five items); and (2) Family-Work Conflict Scale (FWC, five items). The items were measured on a 7-point Likert scale (Simões et al., 2019). Confirmatory factor analysis showed that the two-factor model had acceptable fit ($\chi^2(29) = 87.580$; RMSEA = .068; CFI = .985; TLI = .977; NFI = .978).

Primary and Secondary Cognitive Appraisal Scale

The Primary and Secondary Cognitive Appraisal Scale (PSCA, Gomes & Teixeira, 2016) evaluates how an individual assesses a work-related situation. It includes 12 items

distributed across the following four dimensions: (1) threat perception (three items); (2) challenge perception (three items); (3) coping potential (three items); and (4) control perception (three items). The items were measured on a 7-point Likert scale. Instructions to fulfil the instrument were adapted to teacher activity, meaning that participants answered the questions thinking about their work. Confirmatory factor analysis showed that the four-factor model had acceptable fit ($\chi^2(48) = 81.138$; RMSEA = .040; CFI = .987; TLI = .982; NFI = .969).

Shirom-Melamed Burnout Scale

The Shirom-Melamed Burnout Scale (SMBS, Shirom & Melamed, 2006; Adaptation Reis, Gomes, & Simões, 2018) evaluates how an individual experiences burnout. It includes 14 items distributed across the following three dimensions: (1) physical fatigue (six items); (2) cognitive weariness (five items); and (3) emotional exhaustion (three items). The items were measured on a 7-point Likert scale. Confirmatory factor analysis showed acceptable fit indices for both the three-factor model of burnout ($\chi^2(69) = 174.609$; RMSEA = .059; CFI = .986; TLI = .982; NFI = .977), and the second-order factor model of burnout ($\chi^2(64) = 205.291$; RMSEA = .071; CFI = .981; TLI = .973; NFI = .973).

Data Analysis

Structural equation modelling (SEM) was used to test the hypotheses. The analysis consisted of two steps. In the first step, we tested the measurement model to assess its construct validity. In the second step, the structural models were tested. All analyses were conducted in AMOS 24.0.

Maximum likelihood (ML) estimation methods were used. To assess model fit, we used the χ^2 goodness-of-fit statistic, the root mean square error of approximation (RMSEA, Steiger, 1990), the Tucker-Lewis index (TLI, Tucker & Lewis, 1973), the Normed Fit Index (NFI, Bentler, 2007), and the comparative fit index (CFI, Bentler, 2007). The cut-off criteria used in this study followed generally accepted criteria described in the literature: RMSEA values $< .050$ indicate excellent fit, $\leq .080$ acceptable fit; TLI values higher than .900 indicate acceptable fit; NFI values higher than .950 indicate excellent fit, and those $\geq .900$ are interpreted as good; CFI values close to .950 indicate excellent fit, and those $\geq .900$ are interpreted as good (Bentler, 2007).

We also used the χ^2 difference test to compare the fit of nested models. Finally, the bootstrap procedure of AMOS was used to obtain 95% confidence intervals (CIs) around parameter estimates (MacKinnon, Fairchild, & Fritz, 2007). Bootstrapping is considered a powerful resampling method for obtaining parameter estimates and confidence intervals when the variables are not assumed to be normally distributed (Yuan & Hayashi, 2003). We used bootstrapping with 2000 samples and 95% bias-corrected CIs as recommended by Mackinnon, Lockwood and Williams (2004) and Cheung and Lau (2008). Statistical detectable differences considered the recommendations of Wasserstein, Schirm and Lazar (2019).

Results

Relationship between the Variables

The means, standard deviations, and Spearman correlations between the variables are presented in Table 1. Regarding the mean values of the WFC & FWC instruments, the values of work-family conflict were higher than the values of family-work conflict. For the PSCAS instrument, the values of coping potential were higher than the values of challenge perception, and control perception assumed higher values than threat perception. Regarding the SMBS instrument, physical fatigue had the highest values, followed by cognitive weariness, and emotional exhaustion, which had the lowest values. Alpha values were also acceptable for all the scales. The correlation between work-to-family conflict and family-to-work conflict was positive. Additionally, work-family conflicts were positively related to threat perception and negatively related to challenge perception and coping potential. Moreover, work-family conflicts were positively related to physical fatigue, cognitive weariness, and emotional exhaustion. Of note, threat perception was positively related to physical fatigue, cognitive weariness, and emotional exhaustion. By contrast, challenge perception, coping potential, and control perception were all negatively related to physical fatigue, cognitive weariness, and emotional exhaustion.

Table 1. Means, Standard Deviations, Alpha Values, and Correlations between the Variables in the Study

Variables	<i>M (SD)</i>	<i>Alpha values</i>	1	2	3	4	5	6	7	8
1. Work-Family conflict	5.027 (1.526)	.955								
2. Family-Work conflict	2.846 (1.417)	.901	.398**							
3. Threat perception	2.235 (1.312)	.825	.435**	.290**						
4. Coping potential	4.811 (0.768)	.851	-.104*	-.127**	-.376**					
5. Challenge perception	4.349 (1.109)	.856	-.125**	-.084	-.356**	.397**				
6. Control perception	4.090 (0.893)	.790	-.105*	.003	-.281**	.438**	.376**			
7. Physical fatigue	4.367 (1.459)	.950	.559**	.281**	.501**	-.292**	-.344**	-.216**		
8. Cognitive weariness	3.632 (1.544)	.968	.455**	.344**	.447**	-.374**	-.264**	-.216**	.769**	
9. Emotional exhaustion	2.300 (1.262)	.914	.185**	.421**	.311**	-.233**	-.133**	-.089	.335**	.520**

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

Work-family Conflicts, Cognitive Appraisal and Burnout: Preliminary Analysis

A data screening analysis was conducted to detect univariate and multivariate outliers using the protocol described by Tabachnick and Fidell (2013). Standardized z-scores were inspected, and those larger than 3.29 ($p < .001$) were removed. Cases with a Mahalanobis distance greater than $\chi^2_{(36)} = 67.985$ ($p < .001$) were also removed. This strategy led to the removal of 13 participants from the initial sample of 438 participants; thus, the data of 425 participants was tested in the set of analyses described below.

Measurement Model

The fit of the single-factor model with all study variables loading onto a single latent variable was compared with that of a nine-factor model that included work-family conflict, family-work conflict, threat perception, challenge perception, coping potential, control perception, physical fatigue, cognitive weariness, and emotional exhaustion. The nine-factor model fitted well to the data ($\chi^2(554) = 949.160$; RMSEA = .041; CFI = .974; TLI = .970; NFI = .939), and its fit was superior to that of the single-factor model ($\Delta \chi^2(36) = 6663.118$; $p < .001$). All standardized factor loadings were statistically detectable, ranging from .626 to .975. These results confirmed the validity of the specified nine-factor measurement model.

Testing the Structural Models

To simplify the models tested, we reduced the number of manifest variables in the analysis regarding burnout dimensions, by using the second-order factor model. This option allows an increase in factor reliability and in its probability to be normally distributed, as well as a decline in the idiosyncratic variance and in the ratio of measured variables to subjects (Marsh, Richards, Johnson, Roche, & Tremayne, 1994).

The structural models were tested to determine whether a mediated model exhibited a better fit than the direct effect models, and which type of mediation (e.g., partial or full) better described the data. The direct model established a relationship from work-family conflict, family-work conflict, threat perception, challenge perception, coping potential, and control perception to burnout. The mediation model established a relationship between work-family conflict, family-work conflict, threat perception, challenge perception, coping potential, control perception, and burnout. The partial mediation

model added direct paths from work-family conflict to threat perception and to challenge perception, from family-work conflict to threat perception and to challenge perception, from threat perception to control perception and to coping potential, and from challenge perception to control perception and to coping potential, and assumed no direct paths from threat perception to burnout or from challenge perception to burnout. The full mediation model assumed no direct paths from work-family conflict or family-work conflict to burnout. The fit indices of the three structural models are presented in Table 2.

The direct effects model (RMSEA = .064, CFI = .933, TLI = .928, NFI = .899) and the full mediation model (RMSEA = .056, CFI = .949, TLI = .945, NFI = .915) showed acceptable fit indices, but the partial mediation model, which included all direct and indirect effects, appeared to have the best fit (RMSEA = .051, CFI = .958, TLI = .954, NFI = .923).

The difference in chi-square between the direct effects model and partially mediated model was statistically detectable ($\Delta\chi^2(7) = 375.179$; $p < .001$), indicating that the mediation effects cannot be ignored. The difference in chi-square between the fully and partially mediated models was statistically detectable ($\Delta\chi^2(2) = 128.427$; $p < .001$), indicating that the direct effects cannot be ignored. Table 3 presents the standardized effects for the partial mediation model, namely the parameter estimates of the structural path coefficients and the squared multiple correlation coefficients. The estimates of the direct and indirect effects were based on 2000 bootstrap samples, and the corresponding 95% bias-corrected CIs of these bootstrap estimates are also presented. The partial mediation model explained 26% of the variance in threat perception, 3% of the variance in challenge perception, 29% of the variance in coping potential, and 21% of the variance in control perception. Furthermore, this model explained 46% of the variance in burnout. The path coefficients and regression coefficients can be observed in Figure 1.

Table 2. Fit Indices for the Three Structural Models

Model	χ^2	<i>df</i>	RMSEA	PCLOSE	CFI	TLI	NFI
Direct effects	1585.156	581	.064	< .001	.933	.928	.899
Full mediation	1338.404	576	.056	.070	.949	.945	.915
Partial mediation	1209.977	574	.051	.319	.958	.954	.923

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2 Table 3. Standardized Effects (95% Confidence Intervals) in Partial Mediation Models

	Dependent Variables					
	Challenge perception	Threat perception	Control perception	Coping potential	Burnout	
					Direct effect	Indirect effect
Family-Work conflict	-.029 (-.155, .098)	.113 (.002, .237)			.101 (-.008, .208)	.016 (-.012, .046)
Work-Family conflict	-.158** (-.278, -.036)	.448** (.329, .558)			.474** (.363, .599)	.070** (.040, .109)
Challenge perception			.385** (.262, .499)	.420** (.305, .522)		
Threat perception			-.223** (-.346, -.106)	-.304** (-.423, -.188)		
Control perception					-.093 (-.189, .003)	
Coping potential					-.271** (-.373, -.167)	
R²	.030** (.005, .069)	.258** (.174, .347)	.213** (.130, .291)	.291** (.198, .374)	.455** (.350, .546)	

3 *Note.* ** $p < .01$.

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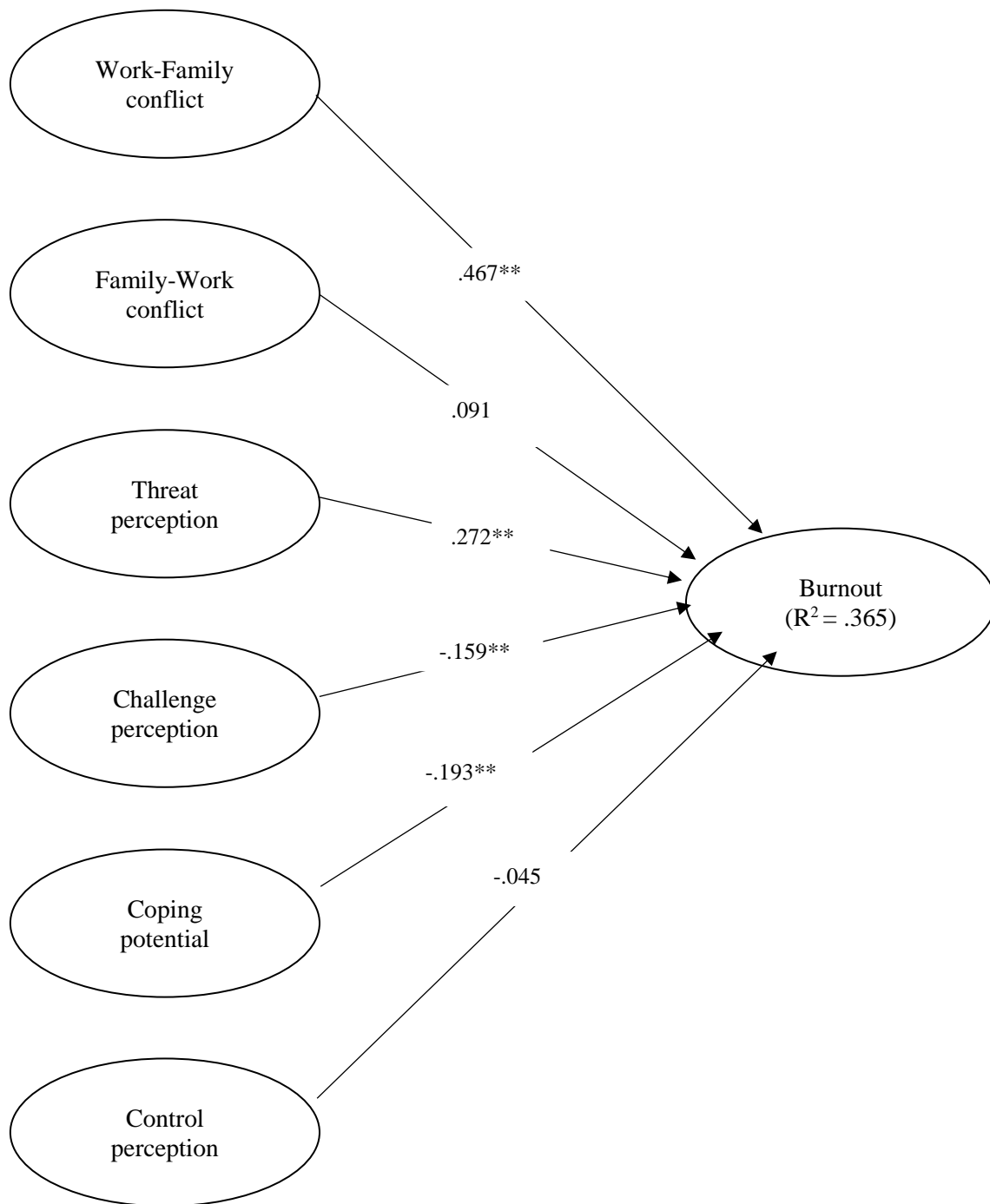
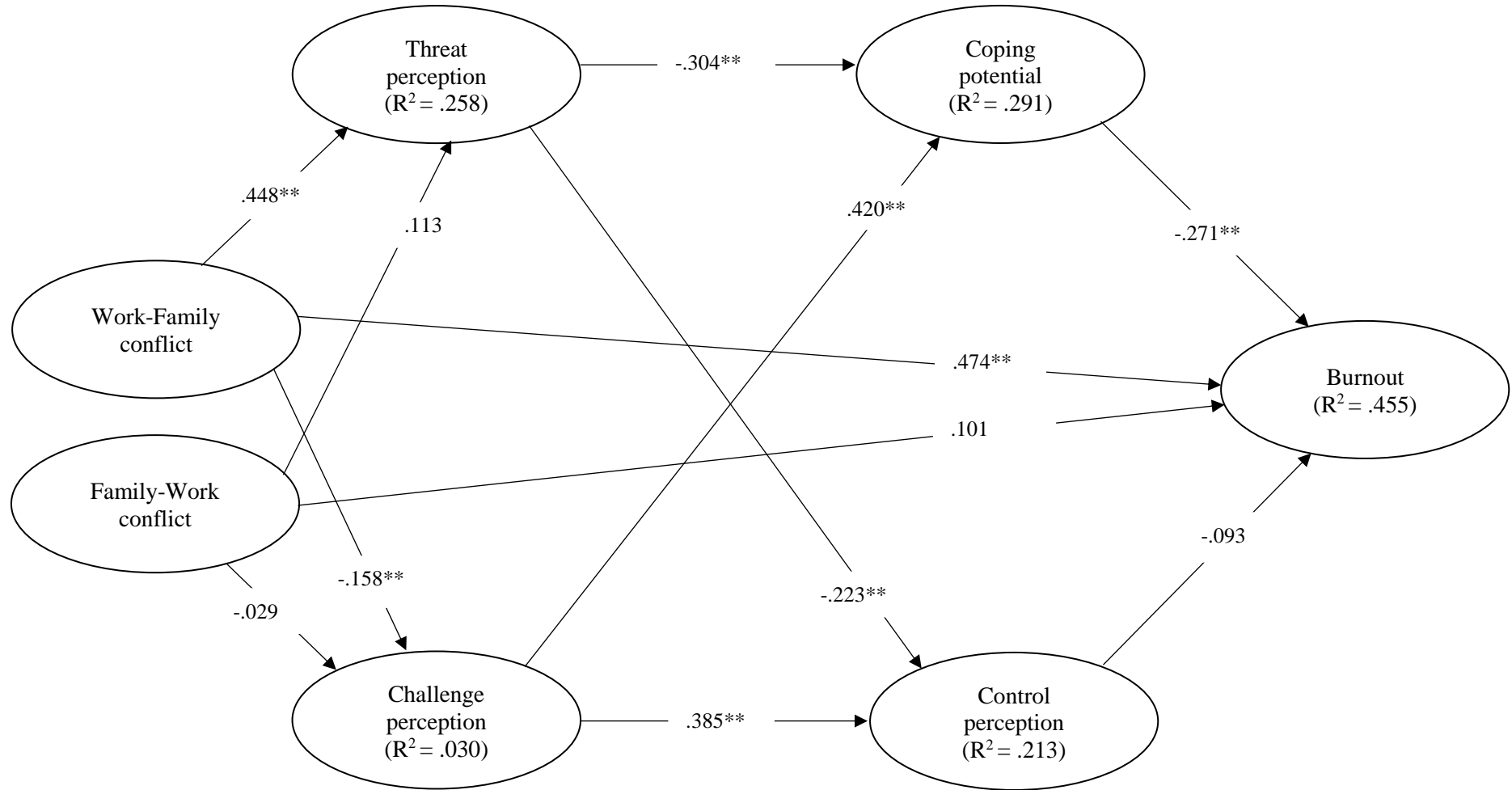


Figure 1. The direct effect model with standardized regression coefficients.

Note. ** $p < .01$.

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17 Figure 2. The partial mediation model with standardized regression coefficients.
18 Note. * $p < .05$, ** $p < .01$.

Multigroup Invariance Analysis

Through multigroup SEM (Loeys, Talloen, Goubert, Moerkerke, & Vansteelandt, 2016; Marôco, 2010), we examined whether sex and age moderate the mediation effect of cognitive appraisal on the relationship between work-family conflicts and burnout. For the purpose, we tested a series of sequentially constrained models to determine the model's measurement and structural invariance across the subgroups of sex (male or female) and age (lower than or equal to, or higher than the median) subgroups.

Configural invariance was examined by replicating the model in both groups; metric invariance was examined by constraining factor loadings; scalar invariance was examined by constraining factor loadings and item intercepts; and structural invariance was examined by constraining the structural paths on the model, while maintaining scalar invariance on the measurement model. These models were compared with a χ^2 -difference test and each detectable χ^2 -difference test implied inequality between the groups on the constrained parameters.

Table 4 presents the fit indices for multigroup structural equation models (sex). The model presented good fit for male individuals ($\chi^2(574) = 806.673$, RMSEA = .057, CFI = .946, TLI = .941) and female individuals ($\chi^2(574) = 1077.916$, RMSEA = .055, CFI = .952, TLI = .948). Results from the multigroup SEM supported the baseline structural models (configural invariance) by presenting an acceptable model fit ($\chi^2(1148) = 1885.747$, RMSEA = .039, CFI = .950, TLI = .946). The comparison between the configural invariance and the metric invariance models suggested no meaningful group differences for factor loadings (χ^2 -difference test $\Delta\chi^2(27) = 24.188$; $p = .620$). Metric invariance was thus supported. The comparison between the metric invariance and the scalar invariance models showed a statistically detectable χ^2 -difference test ($\Delta\chi^2(36) = 132.459$; $p < .001$), suggesting meaningful group differences for item intercepts. The model was therefore modified, releasing the equality constraints imposed to the intercepts that were non-invariant (two of the item intercepts for family-work conflict and all the item intercepts for work-family conflict, coping potential, physical fatigue, and cognitive fatigue). The comparison between the modified model (partial scalar invariance model) and the metric invariance model suggested no meaningful group differences for item intercepts (χ^2 -difference test $\Delta\chi^2(15) = 23.213$; $p = .080$). Partial scalar invariance was thus supported. The comparison between the structural invariance and the partial scalar

invariance models showed a statistically detectable χ^2 -difference test ($\Delta\chi^2(14) = 28.148$; $p = .014$), suggesting meaningful group differences for structural paths. The model was therefore modified, releasing the equality constraints imposed to the structural paths that were non-invariant (paths from work-family conflict to challenge perception; family-work conflict to challenge perception; and from family-work conflict to burnout). The comparison between the modified model (partial structural invariance model) and the partial scalar invariance model suggested no meaningful group differences for structural paths (χ^2 -difference test $\Delta\chi^2(11) = 16.567$; $p = .121$). Partial structural invariance was thus supported.

Table 4 presents the fit indices for multigroup structural equation models (age). The model presented good fit for individuals whose age was lower than or equal to the median age ($\chi^2(574) = 1027.862$, RMSEA = .063, CFI = .936, TLI = .930) and individuals whose age was higher than the median age ($\chi^2(574) = 905.003$, RMSEA = .055, CFI = .953, TLI = .949). Results from the multigroup SEM supported the baseline structural models (configural invariance) by presenting an acceptable model fit ($\chi^2(1148) = 1932.857$, RMSEA = .042, CFI = .945, TLI = .939). The comparison between the configural invariance and the metric invariance models suggested no meaningful group differences for factor loadings (χ^2 -difference test ($\Delta\chi^2(27) = 25.182$; $p = .564$). Metric invariance was thus supported. The comparison between the metric invariance and the scalar invariance models showed a statistically detectable χ^2 -difference test ($\Delta\chi^2(36) = 62.814$; $p = .004$), suggesting meaningful group differences for item intercepts. The model was therefore modified releasing the equality constraints imposed to the intercepts that were non-invariant (all item intercepts for coping potential; one item intercept for physical fatigue, and two item intercepts for cognitive fatigue). The comparison between the modified model (partial scalar invariance model) and the metric invariance model suggested no meaningful group differences for item intercepts (χ^2 -difference test $\Delta\chi^2(30) = 38.610$; $p = .135$). Partial scalar invariance was thus supported. The comparison between the structural invariance and the partial scalar invariance models suggested no meaningful group differences for structural paths (χ^2 -difference test $\Delta\chi^2(14) = 13.486$; $p = .489$). Structural invariance was thus supported.

Table 4. Fit Indices for Multigroup Structural Equation Models (Gender and Age)

Model (Gender)	χ^2	<i>df</i>	$\Delta\chi^2$	Δdf	<i>p-value</i>	RMSEA	CFI	TLI
Male Sample	806.673	574	---	---	---	.057	.946	.941
Female Sample	1077.916	574	---	---	---	.055	.952	.948
Configural Invariance	1885.747	1148	---	---	---	.039	.950	.946
Metric Invariance	1909.936	1175	24.188	27	.620	.039	.951	.947
Scalar Invariance	2042.395	1211	132.459	36	.000	.040	.944	.942
Partial Scalar Invariance	1933.149	1190	23.213	15	.080	.039	.950	.947
Structural Invariance	1961.297	1204	28.148	14	.014	.039	.949	.947
Partial Structural Invariance	1949.716	1201	16.567	11	.121	.039	.950	.947
Model (Age)	χ^2	<i>df</i>	$\Delta\chi^2$	Δdf	<i>p-value</i>	RMSEA	CFI	TLI
Lower than or Equal to the Median Age Sample	1027.862	574	---	---	---	.063	.936	.930
Higher than the Median Age Sample	905.003	574	---	---	---	.055	.953	.949
Configural Invariance	1932.857	1148	---	---	---	.042	.945	.939
Metric Invariance	1958.039	1175	25.182	27	.564	.041	.945	.941
Scalar Invariance	2020.853	1211	62.814	36	.004	.041	.943	.941
Partial Scalar Invariance	1996.649	1205	38.610	30	.135	.041	.944	.942
Structural Invariance	2010.135	1219	13.486	14	.489	.041	.944	.942

Discussion

The teaching profession is vulnerable to experiencing work-family conflicts and burnout (Garcia-Arroyo et al., 2019; Ilies, Huth, Ryan, & Dimotakis, 2015). Nevertheless, research is still limited regarding the mechanisms that underline that relationship. Specifically, studies on work-family conflict have been somehow neglecting the individual's cognitive reactions (Turluc & Buliga, 2014). Thus, the aim of this study was to analyse if teachers' cognitive appraisal regarding their professional activity would have a mediator effect on the relationship between work-family conflicts and burnout. To do so, we tested two main hypotheses.

Hypothesis 1 stated that primary cognitive appraisal (i.e., threat perception and challenge perception) and secondary cognitive appraisal (i.e., coping potential and control perception) would mediate the relationship between work-family conflicts and burnout. The results showed that the partial mediation model, where direct paths were established from work-family conflict and family-work conflict to burnout, presented the best-fit indices among the three studied models (i.e., direct effects, full mediation, and partial mediation). These findings, aside from confirming that the structural equation model proposed fitted the data, revealed that threat perception, challenge perception, and coping potential had a mediation effect on the relationship between work-family conflict and burnout. However, this pattern of results did not occur on the relationship between family-work conflict and burnout – since the indirect effect between work-family conflict and burnout was the only one statistically detectable. Control perception did not produce mediation effects, nor independent effects on burnout.

These findings are in accordance with other studies (Glaser & Hecht, 2013; Gomes et al., 2013) and theoretical proposals of adaptation to stress (Gomes, 2014; Lazarus & Folkman, 1984), showing that the stressor by itself does not determine stress reactions but rather through the agency of the individuals' cognitive appraisal. In fact, threat appraisals about combining work and family roles elicit negative emotional responses and thoughts, leading individuals to feel incapable of drawing on their available coping resources, and thus being more likely to passively deal with the situation. On the opposite way, challenge appraisals led individuals to feel more capable of drawing on their available coping resources and therefore more motivated and ready to deal proactively with the stressor towards positive human functioning (Gomes, 2014; Lazarus & Folkman, 1984; van Steenbergen, Ellemers, Haslam, & Urlings, 2008). Accordingly, our data suggests that when teachers equate their activity to a challenge instead of a threat and

when they have higher coping resources to face work stress situations then they may buffer the negative effect of work-family conflict on the experience of burnout. Thus, work-family conflict, considered one of the most relevant and strongest predictors of teacher burnout (Zábrodská et al., 2018), can be depleted from its negative effects by cognitive appraisal – a perception of challenge and an effective coping potential regarding the teaching profession.

Results revealed that the direct effect of work-family conflict on burnout is also important since the partial mediation model presented the best-fit indices in comparison to both the full mediation model and the direct model that assumed a relationship between work-family conflict and burnout. This relationship was positive, suggesting that if work-family conflict increases then the experience of teacher burnout also increases, independently of the way they appraise and cope with the work-family conflict. However, the family-work conflict dimension did not produce independent detectable effects on teachers' experience of burnout. This is a novel finding, showing that family responsibilities are not related to feelings of burnout, thus suggesting that teachers' family demands are managed in an adaptive way or at least do not contribute to burnout. Research highlights the prevalence and relevance of work-family conflict, in comparison to family-work conflict, as one of the major sources of occupational stress with serious implications for the individuals' general mental health (Simões et al., 2019; Zábrodská et al., 2018). To prevent or reduce the experience of burnout, work organizations (e.g., principals) must attend to work climate characteristics and facilitate a closer alignment between teachers' work demands and their family responsibilities – e.g., by implementing flexible work schedules; reducing bureaucratic tasks; improving teachers' autonomy and participation in decision making; reducing the number of students per classroom, and the number of tasks to be accomplished outside teaching hours.

Hypothesis 2 stated that the mediation effect of cognitive appraisal on the relationship between work-family conflicts and burnout would be invariant regardless of teachers' sex or age. The findings confirmed the hypothesis, attesting that the partial mediation model presents the best-fit indices regardless of the participants' sex or age. In our sample, cognitive appraisal seems to be important for both male and female teachers, younger or older, when analysing the effect of occupational sources of stress (i.e., work-family conflict) on the experience of burnout. These outcomes are in line with a meta-analysis developed by García-Arroyo and Segovia (2018), showing that demographic variables, as sex and age, did not predict burnout. Despite teaching being a female-

dominated profession, and despite women appear to be more prone to experience work-family conflicts (Simon, Kummerling, & Hasselhorn, 2004) and burnout (Garcia-Arroyo et al., 2019), the research is not consensual. Some studies have shown that sex plays a moderator effect on the expression of burnout (Livingston, 2014), while other studies argue that neither sex or age play an independent or moderator effect on burnout (Ju, Lan, Li, Feng, & You, 2015). Due this moderating equal effect of gender on burnout, authors propose that it is necessary to take into consideration the environmental and cultural conditions where teachers exert their activity (Garcia-Arroyo et al., 2019).

The findings from this study reinforce the need for the implementation of occupational health interventions by qualified professionals (e.g., occupational psychologists; health psychologists) to help teachers to adopt positive attitudes regarding their professional activity, specifically by appraising their work as more challenging and less threatening, by developing coping strategies to face stress related to their work, and by assuming more control over their professional activities. For example, there is evidence that informational support, related to the integration of work and family roles, can influence cognitive appraisal (van Steenbergen et al., 2008). We should also consider organizational interventions in terms of work structure and politics, aiming to render work demands more compatible with family responsibilities, so that teachers can strike family-work balance.

Our study attests the importance of cognitive appraisal in the relationship between work-family conflict and teacher burnout; however, due to its cross-sectional methodology, it was not possible to determine how a stress condition (i.e., family-work conflict) affects the individual over time. To overcome this limitation, future research should use longitudinal methods of data collection to observe how cognitive appraisal affects teachers' adaptation to stress.

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