Electronic Journal of Applied Statistical Analysis
EJASA, Electron. J. App. Stat. Anal.
http://siba-ese.unisalento.it/index.php/ejasa/index
e-ISSN: 2070-5948
DOI: 10.1285/i20705948v13n3p739

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Published: 15 December 2020

Electronic Journal of Applied Statistical Analysis
Vol. 13, Issue 03, December 2020, 739-757
DOI: 10.1285/i20705948v13n3p739

Teacher Stress and burnout: a study using MIMIC modelling

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Published: 15 December 2020

A number of recent studies carried out in the education sector have revealed the incidence of burnout in school environments and have highlighted the principal psycho-social sources of burnout syndrome among teachers. This study attempts to look further at the results of a previous research carried out on a sample of 882 Italian teachers. Using advanced statistical techniques such as MIMIC modelling, it intends to verify whether the following psycho-social stress factors are significant as predictors: interpersonal relations, workload, organisational conflict, role ambiguity, perceived role image, work-home interface. Considering that in Italy the recent regulations regarding retirement are triggering new stressful conditions for teachers, this study also aims to assess the role played by age in relation to the sources of psycho-social stress and burnout. The scales we have adopted are the Maslach Burnout Inventory (MBI-ES) and the Cooper's Occupational Stress Indicator (OSI) specifically adapted for Italian schools. Results have shown the clear predictive role of factors such as interpersonal conflict and home-work interface in determining the onset of emotional exhaustion and depersonalization among teachers.

keywords: Burnout, Stress, Teachers, Structural Equation Models.

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1 Introduction

Burnout is a typical problem in caring professions (Maslach and Jackson, 1986; Maslach and Leiter, 1997a), common among health and social workers as well as in education, where teacher-student relations may be a critical factor. The 'helping' nature of relations in educational contexts is rooted in the gradual building up of rapports based on understanding, listening and encouragement, whose purpose is to develop competencies in academic, social and interpersonal skills as well as a sense of gratification in learning (Pedditzi and Marcello, 2018; Pedditzi, Nonnis and Massidda, 2016).

Teacher-student interaction can produce strong emotions, depending on factors such as discipline and socialisation, as well as the teaching workload and complexity of learning processes at different stages of schooling. A series of recent studies carried out in the education sector have revealed that the phenomenon of burnout has long existed in the teaching profession (García-Carmona, Marín, and Aguayo, 2019; Iriarte Redín and Erro-Garcés, 2020; Pedditzi and Nonnis, 2014).

Burnout can be defined as a state of physical, emotional and mental exhaustion that sets in as a result of long-term exposure to emotionally draining work conditions (Maslach and Leiter, 1997b). In one of their early models, Maslach and Jackson (1986) defined burnout as a syndrome of emotional exhaustion, depersonalisation, low levels of personal achievement, which can manifest in staff who work in direct contact with people (Maslach, 1982). Symptoms of emotional exhaustion include feeling overwhelmed, fatigue and feebleness from an excessive amount of work. Depersonalisation usually results in the subject feeling a critical aversion to the people they work with or serve, which is a form of self-defence from becoming emotionally involved. Low achievement in the workplace also generates feelings of incompetence and personal and professional failure.

Maslach and Leiter (1997a) also stress that burnout can be better comprehended if we look at the root causes of occupational stress together with interpersonal relations in the workplace. They apply their generalised burnout model (Maslach and Leiter, 1997b) to all work organisations as an indicator of the state of relations between workers and companies.

In line with these studies, recent research has tended to focus on the Job Demands-Resources model (Bakker et al., 2011; Demerouti and Bakker, 2011; Doménech Betoret and Gómez Artiga, 2010), which states that burnout arises when an individuals own resources are limited (Nonnis et al., 2018). The model shows that demands induce emotional exhaustion/breakdown, while job resources abate depersonalisation (defined by the authors as being a disinvestment, to refer to a general process of withdrawing from ones work) and have a positive effect on professional achievement (Bakker et al., 2003).

What is particularly highlighted is the contrast between demanding work conditions and the low salary scale of workers in question (Zurlo, Pes, and Cooper, 2007). Among

the various models examining the sources of stress in work environments, Cooper, Sloan, and Williams (1988) descriptive model enables us to identify a series of causes of strain, which might go from variables associated intrinsically to the job (e.g. noise levels, lighting, over-work, time pressure, etc.) to variables relating to an employees role in the organisation (e.g. ambiguity, overlapping or conflict of roles) or perhaps to career development and progression (e.g. expectations frustrated and role demotion) and workplace relations.

A further factor is an employee's work-home interface. In the sphere of interpersonal relations, some chief causes of burnout include dealing with difficult and undisciplined students, demotivation in studying, lack of cooperation and conflict with students and parents Skaalvik and Skaalvik (2007), all of which will likely have negative repercussions on teaching-learning processes (Pas et al., 2010; Quattrin et al., 2010; Spilt, Koomen, and Thijs, 2011).

Among the various factors that induce teacher stress (Kahn, Jones, and Wieland, 2012; Pedditzi and Lucarelli, 2014; Pedditzi, 2020; Ingusci et al., 2016; Signore et al., 2019), some studies have examined the notion of a teachers ideal image and real perceived image of their job (Pedrabissi and Santinello, 1990; Pedditzi and Nonnis, 2014). What seems to be the case here is that those who go into teaching because they find no alternative will be more vulnerable to burnout than those who consciously choose to work in education for idealistic reasons (Hong, 2010, 2012).

The image of oneself and one's role and convictions as a teacher (Gong, Zhao, and Yeon, 2012) is closely connected to effort and commitment to work (Spilt, Koomen, and Thijs, 2011; Day, Elliot, and Kington, 2005). A further factor to note is that teachers are increasingly aware of the diminished social prestige of the teaching profession compared to a past in which teachers were held in much greater regard; their self-worth is consequently affected. This also impinges on family life, in that a teachers deflated self worth affects family-work harmony, making it difficult to combine family and work obligations (Cooper, Sloan, and Williams, 2009; Hultell and Gustavsson, 2011; Chan et al., 2000; Innstrand et al., 2008; Pedditzi, 2015a).

There are two theoretical assumptions in our study. First, Cooper, Sloan, and Williams (2009) occupational stress model, which helps pinpoint the main factors responsible for occupational stress. Among these are the many psycho-social causes such as personal conflict, the family-work interface and the gap between professional and social status, which will be examined from the perspective of the perceived personal and professional image that teachers have of themselves.

Secondly, Maslach and Jackson's (1986) burnout model (Sirigatti and Stefanile, 1993), which we have chosen to use instead of their subsequent model due its effectiveness in identifying the key difficulties in relations with students, notably isolation, apathy and conflict with pupils. Recent studies on the subject of teacher burnout have devised a

scale of depersonlisation as an essential construct in studies of this phenomenon, in particular the psychological aspects induced by cynicism and indifference towards students (Aluja, Blanch, and García, 2005; Gold, Bachelor, and Michael, 1989). Indeed, Maslach and Jackson (1986) and Sirigatti and Stefanile (1993) found that teachers suffering from burnout can manifest indifference towards their students, on occasion using offensive names as well as becoming distant, both physically and emotionally.

A previous study carried out on primary and secondary school teachers found that interpersonal relations in school environments and the personal image teachers have of themselves in relation to their job are the chief underlying psycho-social causes of stress that lead to teacher burnout syndrome (Pedditzi and Nonnis, 2014). Drawing on this research which has focussed on the psychological aspects of teacher burnout, our study looks specifically at depersonalisation of workers in helping jobs, taking account of interpersonal conflict between students and colleagues in addition to conflict in the work-family interface as being the potential psycho-social root causes that are responsible for breakdown and depersonalisation in burnout.

In Italy different studies highlighted the presence of burnout in teachers and revealed that the consequences for teachers' health are notable (Lodolo D'Oria et al., 2004; Pedditzi and Nonnis, 2014; Pedditzi, 2015a, 2015b; Zurlo, Pes, and Capasso, 2016). For example, Lodolo D' Oria and colleagues (2004) analyzing 3,447 medical examinations performed to certificate incapacity to work from 1992 to 2003 in a health district in Italy found that teachers were between two to three times more likely to develop a psychiatric disorder than other professionals such as clerks and health care professionals.

Moreover, in Italy, the percentage of teachers over 50 years old is exceptionally high if compared to other European countries (OECD, 2014). Germany Portugal and Italy have the highest European age thresholds for retirement: 42-43 years of contributions or 67 years of age (Sottimano et al., 2018). The recent regulations may trigger new stressful conditions for teachers because the age gap between students and teachers will tend to increase in the future. Moreover, among the salaries in Europe, in Italy teachers have among the lowest (OECD, 2014) and there is evidence of the impact of professional and social status on teachers' burnout (Pedditzi and Nonnis, 2014).

For this reason, this study aims to analyze the burnout in a sample of teachers in Italy, taking into account their age. The role of age in the burnout research is still a matter for discussion. Sometimes, aging is also associated to burnout (for example, in Narumoto et al., 2008; and in Converso et al., 2015) and age predicts burnout, especially through depersonalization and emotional exhaustion.

Other studies instead reported teacher age as negatively correlated with burnout, meaning older teachers experienced less emotional exhaustion and depersonalization while having greater personal accomplishment (Pedrabissi, Rolland, and Santinello, 1993; Brunsting, Sreckovic, and Lane, 2014). The reduction of burnout over time has also been

attributed to the decline in idealistic expectations and a greater sense of reality and adaptation to the environment. According to others, the presence of minor burnout among older teachers may be due simply to the fact that the older subjects affected by the syndrome are simply absent since they may have left work in the meantime (Maslach, 1982).

Although there have been numerous studies on teacher burnout in Italy, there remains a gap in the literature with regard to updated data using the MBI-ES to look specifically at causes of stress in relation to age. Although there are more recent models and tools, MBI-ES continues to be a highly effective instrument because it can provide comparisons with a wide range of international literature on the subject of burnout and because the depersonalisation scale helps to better understand problems relating to constructing teacher-student relationships.

2 Aims

This study aims to look in depth at the results of previous research on the causes of psycho-social stress among teachers that lead to burnout. We examine the results of one particular study on a sample of 882 Italian teachers, in order to assess whether or not advanced statistical techniques such as MIMIC modelling will confirm the direct involvement of key factors that are reliable predictors of teacher burnout from psycho-social stress (Pedditzi and Nonnis, 2014). We refer to interpersonal conflict, workload, organisational conflict, ambiguity and overlapping of roles, and how the work-home interface relates to the image teachers have of their personal/public role.

A further aim is to substantiate, within the sample considered, whether or not there are significant differences related to the age of teachers, given the particular circumstance of Italian teachers being generally older than their counterparts in other European countries.

2.1 Methods

2.1.1 Participants and procedure

Participants were 882 Italian teachers employed in public schools, in particular they were from primary (52.4%) and middle school (47.6%). They were 84.4% females and 15.6% males, ranging from 27 to 63 years of age (mean = 47.5, SD = 7.98).

The sample was taken from schools in the south and centre of Italy (18.5% from Rome; 30% from Sassari, 20.2% from Bari and 31.3% from Cagliari). 59.9% of the sample were married. 68.7% had children, meaning 31.3% did not. 28% of teachers who did not have children were under 37 years old. The length of service was between 1 and 39 years

(mean = 19.56, SD = 9.3).

The participants were recruited once prior authorization from their schools had been obtained for them to voluntarily complete an anonymous questionnaire during school hours. They completed the questionnaire individually, in a paper-pencil survey, during break time at school. The informed consent was requested and privacy was guaranteed. The sample obtained was therefore one of convenience, and the response rate to the questionnaire was 75% (out of 1200 distributed, 902 were completed, 882 of which were valid).

The study was conducted according to the APA guidelines for ethical research in psychology and the Ethics Committee of the Cagliari University approved the research (UniCa - Prot. n. 0040431 on 13 February 2020).

2.1.2 Measures

To investigate burnout, we used the Italian adaptation (Sirigatti and Stefanile, 1993) of the Maslach Burnout Inventory-ES (Maslach and Jackson, 1986), while to assess the psycho- social causes of teacher stress, we devised a questionnaire based on Occupational Stress Indicator (OSI, Cooper, Sloan, and Williams, 2009) adapted to the Italian school environment (Pedditzi and Nonnis, 2014; Nicotra, Pedditzi, and Grassi, 2012). The Maslach Burnout Inventory-ES (Sirigatti and Stefanile, 1993) consists of 22 items, assessed on a six points scale (0 = never; 6 = every day) addressing three dimensions:

- Emotional exhaustion (EE), measures feelings of being emotionally overstretched and exhausted from chronic tension (9 items, e.g. "I feel fatigued when I get up in the morning and have to face another day on the job"; "I feel I cant go on", Alpha = 0.87).

- Depersonalization (DP), measures an unfeeling and impersonal response toward recipients of one's instruction (5 items, e.g. "I feel I treat some students as if they were impersonal objects"; "I can easily understand how my students feel about things", Alpha = 0.68).

- Personal Accomplishment (PA) measures feelings of competence and successful achievement in one's work (8 items, e.g. "I feel Im positively influencing other peoples lives through my work"; "I feel very energetic", Alpha = 0.76).

The adapted version of Occupational Stress Indicator (OSI, Cooper, Sloan, and Williams, 2009) specifically for Italian schools (Pedditzi and Nonnis, 2014) consists of 42 items,

assessed on a seven points scale (1 = totally false; 7 = totally true) addressing six dimensions:

- Interpersonal Conflict measure in particular the relational factors with colleagues, students and parents (7 items, e.g. "There are often clashes between me and the people I work with"; "I feel dissatisfied with the relations I have with students and parents", Alpha =0. 74).

- Organisational Conflict measure the structural factors within schools (7 items, e.g. "I don't have faith in the bureaucracy of the school as an institution"; "The bureaucratic procedures interfere with my efficiency and performance at work", Alpha = 0.70).

- Perceived Role Image measures accomplishment stemming from teachers personal perception of their role (7 items, e.g. "I feel underqualified for the job I am doing"; "I have very little chance of career progression towards a managerial role", Alpha = 0.74).

- Work-home Interface assesses the teachers personal or private self-perception (7 items, e.g. "My partner takes a negative view of my job"; "My personal needs are often on conflict with my job", Alpha = 0.72).

- Workload measure the intrinsic job factors which result from work at school (7 items, e.g. "In my work as a teacher I have too many things to do and not enough time to do them"; "I have to move around from place to place every day in my job", Alpha = 0.72).

- Role Ambiguity measure task required, focussing in particular on role responsibilities in teachers daily tasks (7 items, e.g. "There are often contradictions in tasks that teachers are asked to perform"; "The overlapping of my and other people's responsibilities causes problems", Alpha = 0.68).

2.2 Data analysis

In order to identify the main causes of psycho-social stress that are responsible for burnout, we used Multiple Indicators and Multiple Causes (MIMIC) modelling.

We used MIMIC models because they contain several observed variables that function as Multiple Indicators and Multiple Causes of our latent variables. In their simplest form, these models have a single latent variable η caused by a number of exogenous

observed variables X (external to the model) and measured by a number of exogenous observed variables Y (Bollen, 1989). The MIMIC model is particularly useful in all cases in which a single latent trait appears to be caused by a small number of causes that justify its presence and that provides at the same time a high error control modelling. For this reason, we have preferred MIMICs over other methods.

The main advancement in MIMIC was achieved through the works of Jöreskog and Goldberger, and Hauser and Goldberger. The release of the LISREL statistical software by Jöreskog in the 1970s (Jöreskog and Goldberger, 1975) has produced the biggest advancement in estimating MIMIC models. Despite the current effectiveness of other software, LISREL is still popular because of its ability to incorporate factor analysis, path analysis, SEMs into a general covariance structure model (Jöreskog and Sörbom, 1999; Matsueda, 2012).

The fit indices used were RMSEA, RMR, CFI and SRMR ($p < 0.05$).

The point of departure in the analysis to identify the model is the covariance matrix Σ_{xy} among the sources and indicators of the latent variable η.

$$\Sigma_{xy} = E(XY) = E\big[(\lambda^x \xi + \delta)(\lambda^y \eta + \epsilon)\big] \tag{1}$$

MIMIC models are subject to the following constraints:

$$E(\xi \xi') = E(\delta \eta') = E(\xi \epsilon' = 0 \tag{2}$$

The errors in the model must not be correlated with the cause variables and the measurement errors of X should be correlated with both the endogenous and exogenous latent features, which in turn must not be correlated with the errors of measurement of the endogenous variables Y. In simpler terms, the variance component explained by the model must be separate and independent from the unexplained one in order to make the statistical model a simple addition comprising its components. The variance Σ_{xy} is obtained by elaborating equation (1) and in terms of an estimate of the parameters assumes the following form:

$$\Sigma_{xy} = \Lambda_x \Phi \Gamma' (I - B)^{-1} \Lambda_x \tag{3}$$

in which Φ is the covariance matrix between the variables ξ, Λ_x is the structural parameter matrix between the x and ξ values, Γ is the structural parameter matrix between the ξ and η values, and B is the structural coefficient matrix between the η variables. Since the exogenous variables X assume, in this case, the role of causes of the behavior of the endogenous latent tract η, measured by the endogenous observation variables Y, they are considered to be perfect measures of the latent tract η. Thus, for this class of Lisrel models, we need to assume the condition illustrated in the following equation (4):

$$X = \Lambda_x \xi + \delta = 1\xi + 0 = \xi \tag{4}$$

Furthermore, having in this case a single latent variable, it should be noted that all the X variables, which are the cause of the statistical behavior of η, will be expressly written as part of the same latent variable η (Bollen, 1989). In the event of there being a single latent variable η, the matrix of the B parameters will be composed exclusively of zeros. In this case the model will take on the following form:

$$\eta = B\eta + \Gamma\xi + \zeta = 0B\eta + \Gamma\xi + \zeta = \Gamma\xi + \zeta \tag{5}$$

The equation (5) can finally be written in terms of the exogenous variables observed, recognizing that in MIMIC models we have $X = \xi$, therefore the general model takes the form:

$$\eta = \Gamma\xi + \zeta = \Gamma X + \zeta \tag{6}$$

In the presence of the constraints and of the structural nature indicated here, the MIMIC model can be considered similar to a multivariate, multiple regression analysis, having within it two formal constraints:

- The regression matrix must be within a range equal to 1;
- The residual matrix obtained by a comparison between the observed data and the values estimated by the model must satisfy the specific assumptions of the congeneric measurement. A measurement can be said to be congenital if a latent trait is measured by observational variables that demonstrate that they have the same effectiveness of measurement. Thus:

$$Y = \lambda_y\eta + \epsilon = \lambda_y(\Gamma X + \zeta) + \epsilon = \lambda_y\Gamma X + \lambda_y\zeta + \epsilon \tag{7}$$

After the MIMIC models, a one-way anova was applied to verify the effect of age (4 levels) on teachers' burnout. To check for differences related to age, the one-way ANOVA was carried out separately for burnout scales and stress scales.

Four different age groups were considered: under-37 years (N = 173); 38-45 years (N = 214); 46-53 years (N = 285); 54 years and above (N = 210). Both, Duncan and Scheffé's tests were used as post-hoc (sig <0.05).

3 Results

Figure 1 shows the values of the structural parameters of the MIMIC model, elaborated from the sample considered (N = 882 teachers).

The good adaptation of the model to the observed data is detectable as a function of the chi-square index, which, with a margin of 24 degrees obtains the value 23.03, with a probability of $p = 0.517$.

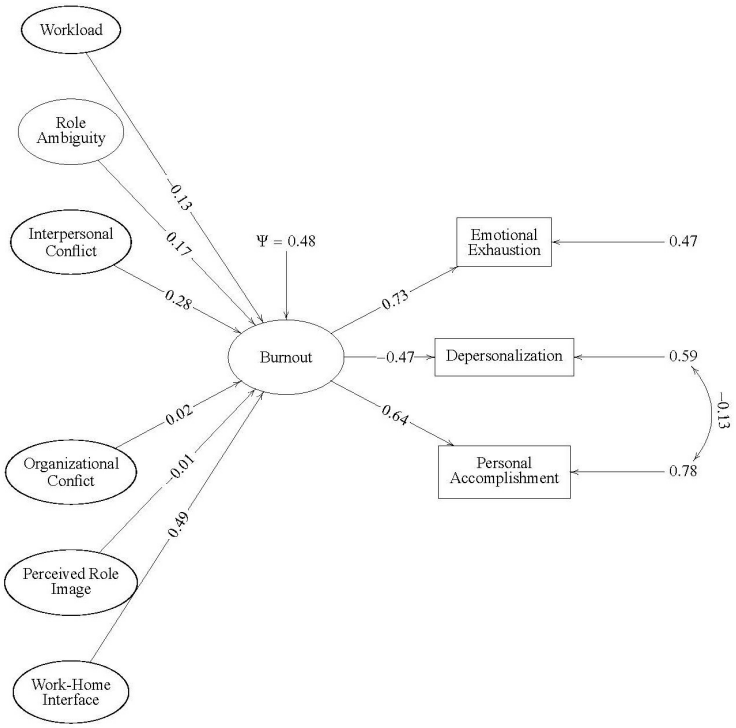

Figure 1: Graphical representation of the MIMIC Model

The model is therefore by no means dismissable. If we also consider the relationship between the chi-square value and the degrees of margin in the model, we obtain the value 0.959, clearly lower than the normally acceptable maximum in the model which refers to the ratio of 2. The residual approximation error, generally indicated in Lisrel with RMSEA $\simeq 0.001$, is therefore negligible.

The parameters of the model that differ significantly from zero are the variables which refer to the stress dimensions related to interpersonal conflict, role/task ambiguity and work-home interface. Work-home interface is connected to the teachers personal or private self-perception. On the other hand, the variables connected with the workload, with the perceived role image and with the organizational conflict are less reliable as predictors of burnout.

Figure 1 shows the values that refer to the structural parameters of the matrix Γ of the model, which indicate the strength of the causal bond that the individual components of the stress have with the latent trait of burnout (formally indicated with η). The parameters are presented in their standardized form equivalent to the Pearson correlation

index r.

The estimates of the parameters not sufficiently reliable from a statistical point of view, refer to the structural links of burnout with the variables due to organizational conflict (t = 0.31) and perceived role image (t = -0.26), which are not significantly different from zero. The t values found for the differences from zero of the lambda-y structural parameters are also statistically significant where $\alpha = 0.05$; therefore, the forecasted effects of sources of work stress on the root causes of burnout are statistically reliable. As can be seen, the component relating to emotional exhaustion is the one with the highest estimate value (r = 0.73), followed by depersonalization (r = 0.64). The model also detects an inverse correlation with respect to the previous variables, which is also statistically significant (r = -0.47). This value indicates, as can be reasonably expected, that as the values of the cause variables (stress) increase, the scores related to emotional exhaustion and depersonalization tend to increase significantly, together with a marked decrease in the scores relating to professional achievement.

Table 1 shows the values relating to multiple correlations, corresponding to the quantities of variance explained by the model in relation to indicators of burnout such as emotional exhaustion, depersonalization and personal accomplishment.

Table 1: Values of R^2

	EE	DP	PA
R^2	0.53	0.41	0.22

By observing the values reported in Table 1, we can see that the instrument detects the variation of the scores more accurately, through the latent trait of burnout, for the emotional exhaustion variable (0.53), at an intermediate level for the depersonalization variable (0.41), while personal accomplishment, with a correlation equal to 0.22, does not seem to be sufficiently explained by the same latent trait.

Table 2: Goodness of fit of the model to the data observed.

	CHI	RMSEA	CFI	SRMR
Values	23.03	0.001	0.99	0.019

The high degree of the values of the models goodness of fit indices to the observed data

(indices normalized in the range [0.1] with the exception of the chi-square, the RMSEA and the SRMR, which must converge to zero) indicate the structural adequacy of the estimated parameters that bring the residual values of the system equations close to zero.

The variance generally explained by the latent trait η refering to burnout, is equal to $R^2 = 0.52$, while the value 1 - $R^2 = 0.48$ represents the unexplained variance attributable to a modeling error. In Lisrel models this value belongs to the variance-covariance matrix Ψ. From the parametric structure obtained, it is clear that the components used to assess work stress such as organizational conflict and perceived role have little, if any predictability of burnout, at least for this class of workers; therefore, such a high measurement of modeling error is probably primarily due to the presence of these variables in the set of causes of burnout. Finally, table 3 shows the values relating to the standardized direct and indirect effects among the cause variables and the indicators of the latent trait of burnout.

Table 3: Comparison of the direct and indirect effects of Xs and Ys.

	Workload	Role Ambiguity	Interpersonal Conflict	Organizational Conflict	Role Image	Work-home interface
EE	-0.10	0.13	0.20	0.01	-0.01	0.36
DP	-0.09	0.11	0.18	0.01	-0.01	0.32
AP	0.06	-0.08	-0.13	-0.01	0.01	-0.23

3.1 Differences with regard to teacher age

3.1.1 Age and Burnout

Significant results were obtained only for Emotional Exhaustion (Table 4).

The One-way ANOVA revealed significant differences for the age groups considered [F (3, 882) = 7.07; p = 0.0001]. Duncan and Scheffé post-hoc test revealed that the youngest teachers under 37s had the lowest levels of emotional exhaustion (N = 173, M = 16.312, SD = 9.19) compared to the other groups of older teachers.

3.1.2 Age and sources of stress

Significant results were obtained only for the source of stress Work-Home Interface (Table 5).

Table 4: One-way ANOVA for Emotional Exhaustion

Age groups	N	Average	DS	F	sig
Under 37 years	173	16.31^{a}	9.19	7.07	0.0001
38-45	214	19.59^{b}	10.82		
46-53	285	18.49^{b}	10.66		
54 and over	210	21.42^{b}	13.33		
TOT	882	19.03	11.25		

F=7.07; df=3; p <0.05

Table 5: One-way ANOVA for Work-Home Interface

Age groups	N	Average	DS	F	sig
Under 37 years	173	2.64^{a}	0.83	3.350	0.019
54 and over	210	$2.78^{a,b}$	0.88		
38-45	214	2.88^{b}	0.88		
46-53	285	2.88^{b}	0.89		
TOT	882	2.81	0.88		

F=3.35; df=3; p <0.05

The One-way ANOVA revealed significant differences for the age groups considered [F (3, 882) = 3.35; p = 0.019]. Duncan and Scheffé post-hoc test revealed significant results for the following groups: the younger teachers group (under 37 years) had the lowest stress scores on the work-home interface than the other teachers (N = 173, M = 2.64, SD = 0.83). The older teachers group (over 54 years old) obtained scores on the work-home interface (N = 210; M = 2.78; SD = 0.88) common to both younger teachers (under 37 years) and intermediate age groups (38-45 and 46-53 years). All the other teachers, in the age groups 38-45 and 46-53 years, had the highest levels of home-work interface stress (N = 214, M = 2.88, SD = 0.88; N = 285; M = 2.88; SD = 0.88).

4 Discussion

The results obtained confirm that the relationships existing between perceived sources of occupational stress and burnout show different levels of reliability as predictors.

Specifically, as shown in Figure 1, the most predictive causes of burnout are related

to the work-home interface and interpersonal conflict, with particular reference to the measurements of emotional exhaustion and depersonalization. The measuring scale for the work-home interface and thus the private and personal image teachers have of themselves attempts to build a picture of how problems at work and perceived personal image relate to each other using statements such as: "My personal needs often conflict with my work routine"; "The need to bring work home causes problems in the family". Teachers personal unease, which will come into conflict with their personal and family needs, constitutes one of the best predictive factors of burnout syndrome with regard to manifestations of emotional exhaustion and depersonalization (see, for example, Simbula and Guglielmi, 2011). Relationships with other people, in particular interpersonal conflict within the work environment are also a strong predictive factor of the syndrome and manifest in statements such as: "There are often unresolved contrasts between me and my colleagues"; "I sometimes find myself blaming or criticizing my colleagues".

The fact that role/task ambiguity affects burnout in only a moderate way indicates that teachers probably adapt to the legislation on school autonomy (see DPR 275/99), which by increasing the opportunities for teachers to take initiatives and become involved in planning, has in practice extended the number of roles and expectations people have of them. This fact is also confirmed by the answers given to the questions concerning role perception and the career success and achievement of teachers, which are not good predictors of burmout syndrome and are calibrated by statements concerning how teachers perceive their role, such as: "I think I am overqualified for the work I do".

The perceived role of teachers is not a good predictor of stress from burnout, even in reference to the lack of opportunities for career advancement, evidenced by statements such as: "In the organisational structure of schools, career opportunities are practically nil"; "I have very little opportunity of progressing to a career in school management".

As regards the fully tested statistical model, the fit indices have strong values that are consistently above 0.90, which is the generally accepted minimum value to confirm the reliability/robustness of the model implemented. It seems then, that the unidimensional burnout model, evaluated through the observed endogenous variables of emotional exhaustion, depersonalisation and personal achievement, can be devised (albeit with varying levels of predictability) using the sources of information gathered regarding teacher stress. The results of this research confirm that the psycho-social sources of occupational stress considered are predictors of burnout but have a mixed predictive efficiency. The most predictive variables of burnout, as hypothesized, are to be found in interpersonal conflicts and the personal image teachers have of themselves. Further analysis confirmed the results already obtained in this area (Pedditzi and Nonnis, 2014). They also have a particular effect on emotional exhaustion and depersonalization that is clearly a characteristic of the conflictuality found in 'helping' relationships, i.e. in the relationship that teachers have with students and colleagues.

With regard to the effects of age, the only significant factors were found in emotional

exhaustion and in the Work-Home Interface. Being a predominantly female sample, the results obtained confirm those already present in the literature on stress related to the work-home interface of Italian teachers (Pedditzi, 2015a) and those relating in particular to the personal and private image of teachers (Pedditzi and Nonnis, 2014). Among the items on this scale we find statements such as: "My personal needs are often in conflict with my work"; "My professional status does not correspond to my social status"; "I have family problems because of the work I have to take home".

Age seems to affect emotional exhaustion especially among older teachers. Lower levels of emotional exhaustion and stress related to the work-home interface are found among younger teachers, who are mainly unmarried and childless. Stress levels linked to the work-home interface and the personal image of teachers tends to increase in subsequent age groups, and emotional exhaustion tends to peak in the age group nearing retirement. These results are in line with those in existing literature, which highlights the relationship between stress, burnout and seniority of teachers (Narumoto et al., 2008; Converso et al., 2015), and also highlight how the work-home interface is associated with greater stress among Italian teachers, often as a result of the absence of support services and policies for maternity as well as the greater family and domestic work overload for women, typical in Italian families (Pedditzi, 2015a).

The results of this study have several practical and research implications.

In terms of the practical implications, it has long been underlined that in order to prevent burnout and to plan effectively for the training of teachers, greater consideration must be given to the psychological pressures of the profession in order to make provisions for the possible effects of the psycho-social causes of stress leading to teacher burnout (Olivas and Martinez, 2012; Burns and Machin, 2013). Burnout could be dealt with at school through prevention measures (Collie, Shapka, and Perry, 2012; Maslach and Leiter, 2008; Simbula and Guglielmi, 2010) aimed at improving the potentially stressful conditions of teachers while also bearing in mind the possible effects of age, gender and length of service connected to socio-cultural variables.

Among the limitations of this study is the need to further integrate the results obtained with qualitative data, aimed at better understanding the close relationship between the variables when considered in relation to specific cultural contexts. Another limitation of this study is in fact the lack of information about the teachers 'selected' for our sample. The use of convenience samples can lead to distortions in the selection itself, increasing the likelihood that the participants are those who more likely to answer the questionnaire regardless of their socio-demographic characteristics. A further limitation of our study is the fact that all data originates from the same source (self-report questionnaires). Future investigations should use different sources, such as qualitative data and other current reference models. For future research, we also intend to conduct a moderation analysis with multilevel multigroup models to more specifically verify the role of gender and age within the schools selected in relation to the aforementioned socio-cultural variables.

Acknowledgement

The authors reported no potential conflict of interest.

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