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Original article

Stress and burnout among French elementary school teachers: A transactional approach

Stress et épuisement professionnel des enseignants français en école élémentaire. Une approche transactionnelle

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Abstract

Teachers meet increasing difficulties in their work: overwork, students dropping out of the system, the discredit of the profession among users of the educational system. These problems are stressors which have an influence on the vulnerability of teachers and lead to burnout. The transactional model of stress by Lazarus and Folkman [Lazarus, R.S., Folkman, S., 1984. Stress, appraisal and coping, New York, Springer] emphasizes the importance of the activity expended by an individual in order to confront a stressful situation. We administered several questionnaires to 410 French elementary schoolteachers during the first term (T1) in order to evaluate: their sociobiographic characteristics; the frequency of professional problems; perceived self-efficacy; social support; and their coping strategies. The burnout of 259 teachers of the same cohort was evaluated during the third term (T2). The results of this research show the interest of taking into account transactional processes in order to study the effects of professional stress on burnout.

Résumé

Les enseignants rencontrent de plus en plus de difficultés dans leur metier : surcharge de travail, élèves en rupture scolaire, profession discréditée auprès des usagers du système éducatif. Ces problèmes sont des sources de stress entraînant la vulnérabilité des enseignants à l'épuisement professionnel (*burnout*). Le modèle transactionnel du stress de Lazarus et Folkman [Lazarus, R.S., Folkman, S., 1984. Stress, appraisal and coping, New York, Springer] souligne l'importance de l'activité déployée par un individu pour faire face à une situation stressante. Nous avons administré à 410 enseignants français en école élémentaire plusieurs questionnaires au premier trimestre d'une année scolaire (T1) afin d'évaluer : leurs caractéristiques sociobiographiques, la fréquence des problèmes professionnels, l'autoefficacité perçue, le soutien social, leurs stratégies de *coping*. L'épuisement professionnel de 259 enseignants de la même cohorte a été évalué au troisième trimestre (T2). Les résultats de cette recherche montrent l'intérêt d'une prise en compte des processus transactionnels pour étudier les effets du stress professionnel sur le *burnout*.

Keywords: Stress; Self-efficacy; Social support; Coping; Burnout; Elementary schoolteachers

Mots clés : Stress ; Autoefficacité ; Soutien social ; *Coping* ; Épuisement professionnel (*burnout*) ; Enseignants en école élémentaire

1. Introduction

The most stressful professions involve a "relationship of assistance and care" (doctors, nurses, dentists, etc.), a physical or material risk (policemen, firemen, transporters of funds, air traffic controllers) or a "moral responsibility" towards others (Cherniss, 1980; Katz and Kahn, 1978 in Smylie, 1999; Truchot, 2004). The job of teaching, which accumulates some of these difficulties, would be particularly stressful (Borg and Falzon, 1989; Kyriacou and Sutcliffe, 1977, 1978, 1979; Laughlin, 1984; Solman and Feld, 1989, in Woods, 1999).

Moreover, teachers' working conditions would have a tendency to deteriorate. Teachers cite the lack of recognition of their work, poor material conditions, work overload linked to

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very heavy programs and a very heterogeneous level of students (Greenglass et al., 1997; Smylie, 1999; Woods, 1999). This is to be compared with the results of a survey carried out by the General Insurance of National Education (MGEN) (Kovess et al., 2001) on 6700 elementary and secondary level teachers, a group which shows a 31 to 45% rate of sick leaves per year (compared to 6 to 29% for other professions).

However, the difficulty of this work is often unrecognized. According to the general public, teachers are privileged. According to the parents, they would be the principal people responsible for the dysfunction of the educational system. They therefore feel degraded. Consequently, it is hardly surprising that the "malaise of teachers" has been raised (Estève and Fracchia, 1988, p. 47).

According to Rascle (2001a), the effects of professional stress are numerous. They can be of a somatic order (biological, physiological, medical) or of a psychological order (cognitive, emotional, behavioral). "Burnout" (professional exhaustion) would be one of the consequences of professional stress. The operational definition made by Maslach and Jackson (1984) is the principal reference in this field. According to these authors, burnout is *"an emotional state in which the worker loses his beliefs and positive feelings (optimism), his sympathy and his respect for the 'clientele'. This moral exhaustion is often accompanied by physical exhaustion, illness or disorders evolving in a psychosomatic mode"* (Maslach, 1999, p. 212). According to Rudow (1999), 30% of European teachers show symptoms of burnout.

2. Theoretical framework of the study

However, the relation between stress and burnout is neither simple, nor linear, nor unidirectional (i.e., cause → effect). Most authors currently agree on the necessity to *"multiply the investigations based on complex models taking into account the impact of a large number of variables"* (Guglielmi and Tatrow, 1998, p. 88).

We have chosen the transactional model of Lazarus and Folkman (1984) to explain the processes involved in professional stress and burnout. According to this model, the activity expended by an individual (cognitive, emotional, behavioral, physiological reactions) in order to confront a situation perceived to be stressful will or will not enable him to overcome this situation. This model emphasizes the importance of the evaluations which the subject makes of the situation (perceived stress[1]) and of his own resources (personal resources, social resources). It also insists on the influence of individual attempts to modify or support the situation or to modify himself (coping[2]) (Fig. 1).

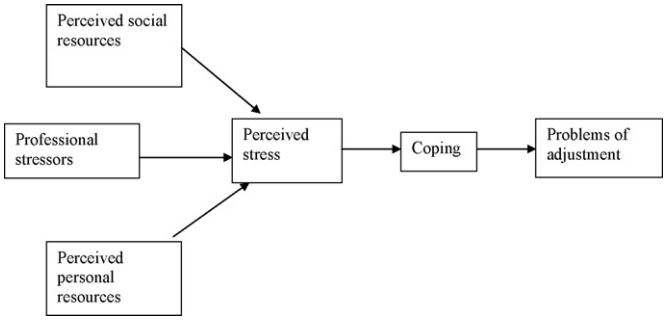

Fig. 1. A transactional model of stress.

The research that was done by our team on stress and burnout in diverse professional groups (teachers, instructors, nurses, doctors, dentists, etc.) has shown the relevance of such an integrative model for understanding the determinants of burnout. Some authors have shown that perceived stress has more important effects than the objective aversive characteristics of the work context on subsequent problems of physical and mental health: certain characteristics of the personality play a protecting role, others a pathogenic role; social resources as well as active coping strategies limit the effects of stress on burnout (Bruchon-Schweitzer, 2002a, p. 60; Rascle, 2001a; Rascle and Bruchon-Schweitzer, 2004).

Numerous studies have been carried out on professional stress among teachers. Several scales of specific stress have been developed such as the Sources of Teacher Pressure Scale (STPS by Travers and Cooper, 1994). Certain stress dimensions of teachers have thus been shown such as overwork, conflicts with parents and coworkers, the lack of career prospects, etc. Nevertheless, not all of the factors described in this research are applicable to French teachers since the Anglo-Saxon scholastic culture is different from ours (for example, there is no real statutory recognition of a school principal in the French education system).

In some of these studies, personality characteristics seem to have a direct effect on burnout. The feeling of self-efficacy limits, for example, the harmful effects of a stressful professional context on health and burnout (Brouwers and Tomic, 2000).

To our knowledge, there are only a dozen research studies devoted to coping strategies that teachers develop to confront professional problems (Brenner et al., 1985; Chan, 1998; Connolly and Sanders, 1988; Dewe, 1985; Gana and Boblique, 2000; Grimm, 1993 in Rudow, 1999; Kyriacou, 1980a, 1980b; Kyriacou and Pratt, 1985; Litt and Turk, 1985; Seidman and Zager, 1991). As a rule, these studies use general scales of coping. For example, Gana and Boblique (2000) have isolated three coping strategies among French teachers based on the Ways of Coping Questionnaire (WCQ) by Folkman and Lazarus (1988):

- search for social support;
- coping centered on the problem;
- avoidance.

Similar results have been found in studies using nonspecific scales of coping (Laugaa and Bruchon-Schweitzer, 2005b).

[1] "Stress is a particular transaction between the individual and the environment in which the situation is evaluated as exceeding his resources or threatening his well-being" (Lazarus and Folkman, 1984, p. 19.).

[2] Coping is "all of the cognitive and behavioral efforts, constantly changing, expended (by one person) to manage the internal and/or external demands perceived as consuming or exceeding his resources" (Lazarus and Folkman, 1984, p 141.).

Studies done with specific coping scales are very rare. Based on the content analysis of interviews with Icelandic teachers, Dewe (1985) obtained 46 items which he administered to a sample of 800 New Zealand teachers. The factorial analysis of their responses made it possible to identify six coping strategies:

- efforts to control the situation;
- job orientation;
- putting in perspective;
- withdrawal;
- search for social support;
- adopting a traditional style of teaching.

General strategies are recognized here: the first three factors are related to coping centered on the problem which corresponds to "*cognitive and behavioral efforts by the subject to modify the situation*" (Bruchon-Schweitzer, 2002b, p 65); withdrawal corresponds to an avoidance strategy as a way of attempting to "*manage the emotional tension resulting from the situation*" (Bruchon-Schweitzer, 2002b); the search for social support corresponds to "*the subject's efforts to obtain sympathy or another's help*" (Bruchon-Schweitzer, 2002b). The last factor (traditional style of teaching) is a strategy specific to teachers which corresponds to the use of lecturing as a teaching method which reduces the interactions between the teacher and the students to a minimum. Based on the French adaptation of this questionnaire, we have shown four coping strategies (coping centered on the problem, avoidance coping, need to communicate, traditional style of teaching) (Laugaa and Bruchon-Schweitzer, 2005b).

We have carried out research on the determinants of burnout among French elementary schoolteachers in order to test the integrative model mentioned above on this population. Our aim was to test the combined effects of diverse antecedents (personality variables, sociodemographic characteristics such as age, length of service, type of school, grade level, etc., the frequency of stressful events encountered in the workplace on a daily basis, etc.) and diverse transactional processes (perceived stress, coping strategies) on burnout using a path analysis. We designed a specific stress scale for this study (Laugaa and Bruchon-Schweitzer, 2005b) and used a specific coping scale for elementary schoolteachers (Dewe, 1985) that we validated on a sample of French teachers (Laugaa and Bruchon-Schweitzer, 2005b).

3. Hypotheses

We make the assumption that certain variables (measured in T1) will have a dysfunctional effect by accentuating burnout among our subjects (measured in T2): the frequency of stressful events, perceived stress, avoidance strategy and traditional style of teaching. Other variables (in T1) could have a functional effect by limiting: self-efficacy, perceived social support and coping centered on the problem. Moreover, we expect that certain transactional processes (perceived stress, coping) mediate the relation between stress and burnout.

4. Méthod

The aim of this study was to test the relevance of this theoretical model on a population of French elementary schoolteachers.

4.1. Subjects and procedure

French elementary schoolteachers can work under very different conditions (in nursery school, part-time, substitute teaching, etc.). In order to have a homogeneous study population, nursery schoolteachers, part-time teachers, teachers-principals, substitute teachers and teachers with several classes were excluded from our survey. The teachers were invited to participate in our research through "referent teachers" who collected the questionnaires in sealed envelopes. The teachers were assured of the total confidentiality of their responses by the cover letter which accompanied the questionnaire. The study was carried out in two stages: in T1 (November–December 2002), 456 out of 750 teachers solicited (60.8%) answered a series of self-administered questionnaires which measured personal and social resources, environmental factors, perceived stress, coping strategies and burnout. The result is satisfactory when keeping in mind the length of the questionnaire (30 to 40 min to complete). Only 410 protocols could be processed statistically (46 of them were incomplete and therefore unusable). The teachers were again solicited during the second school term (T2: May–June 2003), and only 259 teachers (63.2%) of this cohort were evaluated on their level of burnout. This result was disappointing but can be explained by the fact that stage 2 (T2) coincided with a very important teachers' strike caused by a project to decentralize certain activities of the national education.

The descriptive statistics of our two populations in T1 and T2 are shown below (Tables 1–2):

These brief descriptions make it possible to reassure ourselves concerning two points:

- there is no significant difference between the descriptive statistics of our sample and those of the population of French teachers;
- there is no significant difference between the population in T1 and the population in T2 concerning the main sociodemographical characteristics.

This double observation enables us to draw generalized conclusions about the entire population of elementary schoolteachers.

4.2. Measures

4.2.1. Environmental factors

The frequency of professional stressors was evaluated by using a scale specifically constructed for this research (Laugaa et al., 2005a). We asked the individuals who were interviewed to judge how often the 46 professional situations which were retained to construct the scale occur. Four specific dimensions

Table 1
Description of our population in T1.

Sample of teachers	Size (%)	Age	Length of service	Teaching level		Zone	
Total size	410	Mean (S.D.)	Mean (S.D.)	Level 2 (%)	Level 3 (%)	Standard (%)	ZEP (%)[a]
Women	304 (74)	41.17 (9.31)	17.02 (11.83)	166 (54.6)	138 (45.4)	229 (75.3)	75 (24.7)
Men	106 (26)	42.84 (7.64)	20.04 (9.43)	32 (30.2)	74 (69.8)	76 (71.7)	30 (28.3)

[a] Zone Education Prioritaire (ZEP) is a school zone with a large number of students with important scholastic difficulties and socioeconomic problems.

of these different stressors were shown by principal component analysis (PCA) (followed by Varimax rotation):

- "inequity" (explained variance: 13.6%, six items, Cronbach's alpha: 0.78). The items describing this factor are, in descending order: the lack of consideration for the job of teaching (0.79); little perspective of career advancement and promotions (0.77); an inadequate salary in light of the responsibilities and the work put in (0.73); the lack of recognition for the work and the efforts put in (0.66); the lack of consideration on the part of the administration (0.64); the inflexibility of working hours (0.52). This factor refers to the notion of a discrepancy between what the teachers put into their work (professional investment) and what they receive in return (unattractive salaries, little career opportunity, low social recognition). The frequency rate for this type of stressor in our sample is about 40%. A variance analysis with a post hoc Bonferroni test shows that in our population, this feeling is significantly more important among teachers at the end of their careers than teachers at the beginning of their careers ($F = 3.09$; $p = 0.027$). This result can be due to the fact that the image of teaching has recently been enhanced. The status of "school professor" appears to be more "supportable" than that of a teacher. According to Van Horn et al. (1999) and Van Dierendonk et al. (2001), the feeling of inequity, which is close to Siegrist's (1996) model of stress, has a significant effect on burnout;
- "work overload" (explained variance: 11.9%, seven items, Cronbach's alpha: 0.73). The items describing this factor are, in descending order: difficulty making progress with children who are failing academically (0.76); lack of time to monitor the progress of students individually (0.73); feeling responsible for their students' results (0.71); having too many things to do and not enough time to do everything (0.68); being solicited by students' requests for help (0.66); the unavailability of certain students for learning (0.65); heavy workload (0.61); dealing with the heterogeneousness of students (0.60); fear of not finishing the program (0.57); a job which encroaches on the private life (0.57); not being able to do everything that one had planned to do (0.53). This factor appears as a major stressor among teachers (Byrne, 1991; Cedoline, 1982; Farber and Miller, 1981; Kyriacou and Sutcliffe, 1977). This overwork is felt for two reasons, in its quantitative dimension (i.e., the size of the tasks compared to the lack of time to carry them out according to Cooper and Marshall, 1978, in Byrne, 1993; Katz and Kahn, 1978; McGrath, 1983 in Friedman, 2000), and also in its qualitative dimension which refers to the perception that teachers have of the inherent difficulties of their work (i.e., the responsibilities, the demands, the unavailability and the heterogeneousness of the students). The second dimension is essential since French teachers work in an institution in which "*the child is at the center of the educational system*" and for which the struggle against academic failure involves "*a strong mobilization of the actors*" (Orientation Law, Jospin, 1989). The teacher can no longer be content with using professional methods which can be used with all of the students: he must conceive and put into practice a real pedagogical differentiation allowing each child to advance at his own rhythm. The frequency rate of this type of stressor in our sample is the most important (about 70%). The empirical results concerning the link between work overload and burnout are generally very significant (Pettegrew and Wolf, 1982), particularly concerning the facet of emotional exhaustion (Mazur and Lynch, 1989);
- the third factor of stress corresponds to "conflicts and relational problems" (explained variance: 11.4%, five items, Cronbach's alpha: 0.76). The items describing this factor are, in descending order: conflicts or strained relations with parents (0.78); lack of respect, arrogance or violence on the part of some students (0.72); being blamed by some parents for their child's scholastic difficulties (0.69); pressure from the school inspector to improve their work or to work differently (0.68); fear of committing a professional error (0.60). The teacher of the third millennium must "*combine the students' difficulties with the pressure from his hierarchy, the incessant demands of the parents, the nonrecognition of his work and the spillover from society*" (Farber, 1999, p. 592). He feels this diverse pressure as "*brutal and chaotic aggressions*"

Table 2
Description of our population in T2.

Sample of teachers	Size (%)	Age	Length of service	Teaching level		Zone	
Total size	259	Mean (S.D.)	Mean (S.D.)	Level 2 (%)	Level 3 (%)	Standard (%)	ZEP (%)[a]
Women	182	41,98 (9,17)	17,81 (11,89)	102 (56%)	80 (44%)	137(75,3%)	45 (24,7%)
Men	77	42,51 (7,77)	19,36 (9,3)	25 (33)	52 (67)	51 (66,2%)	26 (33,8%)

[a] Zone Education Prioritaire (ZEP) is a school zone with a large number of students with important scholastic difficulties and socioeconomic problems.

(Debarbieux, 1996, p. 45). The frequency rate of this type of stressor in our sample is about 10%;

- the fourth factor corresponds to "role conflicts" (explained variance: 11%, five items, Cronbach's alpha: 0.72). The items describing this factor are, in descending order: compensating for certain lacunae in society (0.72); having to take on several roles for which one has not been prepared (0.70); dealing with the heterogeneousness of students (0.66); the sometimes uncertain results of work with the Réseau aide spécialisée élèves en difficultés (RASED [specialized help network for students in difficulty]) (0.64); having too much paperwork to do (0.52). This factor refers to "*the simultaneous occurrence of two or three sources of pressure which results in the fact that a response to one of these sources of pressure leads to an intolerable gap between one or the other sources of pressure*" (Byrne, 1993, p. 648). This role conflict currently appears very burdensome for teachers (Kelchtermans, 1999) because they must combine the role of instructor (that of dispensing knowledge) with that of an educator who must compensate for the failures of society (to turn a student into a child citizen). This type of stressor represents about 50% of the cases mentioned in our study.

4.2.2. Personal resources

According to numerous studies, the feeling of perceived self-efficacy would be a protective factor against burnout (Greenglass and Burke, 1988; Brouwers and Tomic, 2000). It has been evaluated using a scale by Jerusalem and Schwarzer (1992). PCA confirms the excellent construct validity of this scale. The explained variance of this general factor of self-efficacy is 32.6%. The items are saturated from 0.45 to 0.68 and the Cronbach's alpha is 0.75 .

4.2.3. Social resources

The social support perceived by the teachers was evaluated with the Perceived Social Support Questionnaire (PSSQ) by Bruchon-Schweitzer (2002b, p. 332), which is inspired by the Social Support Questionnaire with six items (SSQ6 by Sarason et al., 1986). The PCA with Varimax rotation on two factors shows the existence of a factor of "availability" which corresponds to the number of individuals that the teacher can count on in the described situation (explained variation: 39%, Cronbach's alpha: 0.83) and a factor of "satisfaction" in relation to this available support (explained variance: 36.5%, Cronbach's alpha: 0.82). These two factors are strongly intercorrelated. This result shows that teachers had difficulty in making the distinction between these two components. We have retained the factor of satisfaction for the ulterior analyses only, in keeping with the idea that it is the qualitative aspect rather than the quantitative aspect of social support that matters.

4.2.4. Evaluating the event

In order to evaluate the level of perceived stress, we asked individuals to judge the intensity of stress brought on by the 46 professional situations in our questionnaire of professional stressors. The PCA of the data shows the existence of a general factor of perceived stress composed of 29 of the 46 items of the scale (we have retained the items whose saturation is between 0.35 and 0.69). The explained variance is 29.6% and the Cronbach's alpha is 0.94.

4.2.5. Coping strategies

Coping strategies were evaluated with a validated French version (Laugaa and Bruchon-Schweitzer, 2005b) of the coping specific to teachers scale by Dewe (1985). The PCA of responses followed by Varimax rotation shows four coping strategies (three of which are general and one is specific):

- the "need to communicate" (explained variance: 12.3%, Cronbach's alpha: 0.77) is also known as the "search for social support" in other coping scales (Greenglass et al., 1997; Kyriacou, 1980). The items describing this factor are, in descending order: letting others know exactly what is your position (0.65); assuring yourself that your coworkers experience things the same way that you do (0.65); talking about a problem with your coworkers (0.62); giving your opinion about how things are done in the school and how they are developing (0.62); discussing problems with the principal (0.60); assuring yourself that others realize that you are doing your best (0.56). These items refer only to the fact of talking about professional problems with coworkers, but not to seeking help or a solution by this means. According to some authors, the interactions between teachers in the same school appear to be limited to "small talk" in which the veritable professional problems met are not raised (Lieberman and Miller, 1984; Little, 1990). The "real" suffering at work remains taboo among teachers;
- "coping centered on the problem" (explained variance: 9.6%, Cronbach's alpha: 0.68) is one of the main adjustment strategies developed against stress. The items describing this factor are, in descending order: attempting to objectively analyze the situation and controlling one's emotions (0.69); thinking about the positive aspects of teaching (0.58); taking stock of the situation and attempting to rationalize it (0.58); giving the students positive encouragement (0.57); attempting to always remain coherent and honest in your relation with the students (0.52). This factor includes cognitive and behavioral responses;
- *avoidance coping* (explained variance: 8,8%, Cronbach's alpha: 0.60) is a general strategy that is also found in many questionnaires. The items describing this factor are, in descending order: not bringing work home (0.65); completely forgetting work when the day is over (0.61); neither working too hard nor too long (0.59); getting more involved in extraprofessional activities (0.57); simply attempting to ignore the problems (0.50); avoiding the other members of the teaching staff (0.42); telling yourself that it is just a job and continuing to do it (0.40). In the face of professional stressors, avoidance coping consists of fleeing from all that concerns professional problems and devoting oneself to something else;
- "adopting a traditional style of teaching" (explained variance: 8.5%, Cronbach's alpha: 0.60) is the only strategy specific to the domain of teaching. The items describing this factor are, in

Table 3
Descriptive statistics of the study data.

Variables	Number of items	Mean	Standard deviation	Cronbach's alpha
Self-efficacy	10	28.05	3.38	0.75
Workload: frequency	7	22.09	3.34	0.78
Inequity: frequency	6	18.57	5.12	0.73
Relational difficulties: frequency	5	11.81	3.94	0.76
Role conflicts: frequency	5	17.99	3.38	0.72
Perceived stress	46	141.80	25.90	0.94
Satisfaction perceived social support	8	26.52	3.21	0.87
Need to communicate	6	21.32	4.24	0.77
Attitude traditional teaching methods	6	17.05	3.01	0.68
Strategies centered on the problem	5	15.88	2.16	0.60
Avoidance	7	11.53	3.08	0.60
Emotional exhaustion	9	32.35	9.10	0.85
Professional nonaccomplishment	8	22.57	5.57	0.78
Depersonalization	5	11.96	4.97	0.67

descending order: maintaining discipline, punishing students (0.76); insisting that the students remain quiet (0.70); behaving in an authoritarian manner (0.59); separating or isolating certain students from the others for a while (0.56); keeping the students busy (0.54); developing habits in your way of teaching (0.54). Maintaining discipline at all costs by behaving in an authoritarian manner and adopting "habits" are among the various ways of protecting oneself from stress by imposing strict working conditions which are restraining for students. This way of doing things appears to be in discrepancy with the orientation law of 1989 which emphasizes the teacher's obligation to devise a differentiated education in which the child is "*at the center of the education system*".

Moreover, in our study, an ANOVA with a post hoc Bonferroni test shows that "need to communicate" coping ($F = 3.26$; $p = 0.02$) and coping centered on the problem ($F = 7.01$; $p = 0.01$) are two strategies that are used significantly more by experienced teachers than by novices.

4.2.6. Burnout

The problems of adjusting to professional constraints are evaluated by the three dimensions of burnout (MBI scale by Maslach and Jackson, 1984): emotional exhaustion (explained variance: 20.2%, Cronbach's alpha: 0.85), professional nonaccomplishment (explained variance: 15.1%, Cronbach's alpha: 0.78) and depersonalization (explained variance: 10.6%, Cronbach's alpha: 0.67). These three scores will be used as predictor criteria in ulterior analyses.

5. Data analysis

We have verified the compatibility of the hypothetical model shown on Fig. 1 with the empirical results obtained by using a structural equation analysis (path analysis) which relates to maximum likelihood procedures (LISREL 8, Joreskög and Sörbom, 1985). This analysis provides the coefficients of direct, indirect and total influence of the personal and situational independent variables on the variables of professional adjustment. The variables are described in Table 3.

The correlation matrix observed (Table 4) is compared to a theoretical matrix constructed on a hypothetical model in order to verify the adjustment of the model to the empirical data.

The degree of similarity between the two matrices indicates the degree of congruity. This confirmatory method uses certain statistical tests such as the χ^2 (representing the distance between the hypothetical model and the empirical model—which must be as low as possible, considering the degree of liberty which takes into account the number of observed variables and the total number of estimated independent parameters), divers indices of adjustment such as the Goodness of Fit Index (GFI) and the Adjusted Goodness of Fit Index (AGFI, as a function of the degrees of liberty) can be interpreted as the proportion of covariances of the observed matrix which can be predicted from the reproduced matrix. These two indicators, which vary between 0 and 1, indicate a goodness of fit when they are superior to 0.90 even if an absolute threshold does not really exist. The root-mean-square error of approximation (RMR) must be inferior or equal to 0.05 (Dickes et al., 1994; Byrne, 1994).

The arrows (Fig. 1) show the hypotheses of our study in relation to the effects of the independent or exogenous variables (self-efficacy, social support and the four dimensions of professional stressors) on the dependent or endogenous variables (perceived stress, the three dimensions of coping and the three dimensions of burnout) based on a transactional model of stress (Lazarus and Folkman, 1984).

6. Results

The whole constrained and tested model (shown on Fig. 1) is compatible with the data of our study. Effectively, the χ^2 (relatively low) and the index of adjustment of the data to the model are satisfactory: $\chi^2 = 13.92$, ddl = 5 ($p = 0.05$); GFI = 0.99, AGFI = 0.85; RMR = 0.02. Moreover, the principal independent variables of the model (self-efficacy, professional

Table 4
Correlation matrix between the study variables.

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Self-efficacy	1	−0.08	0.01	0.00	−0.16**	0.02	0.07	0.06	0.24**	0.00	−0.22**	−0.34**	−0.22**
2. Workload (frequency)		1	0.36**	0.08	0.42**	−0.01	0.46**	0.16**	−0.04	−0.00	0.35**	0.15**	0.15*
3. Inequity (frequency)			1	0.18**	0.41**	−0.06	0.50**	0.17**	0.03	0.19**	0.29**	−0.03	0.20**
4 Conflicts (frequency)				1	0.26**	−0.11	0.06	−0.06	−0.06	0.19**	0.14*	0.04	0.13
5. Role conflicts (frequency)					1	0.05	0.36**	0.22**	−0.01	0.03	0.21**	0.10	0.21**
6. Satisfaction support						1	0.08	0.13*	0.26**	−0.03	−0.08	−0.10	−0.05
7. Perceived stress							1	0.23**	0.00	0.05	0.41**	0.01	0.05
8. Coping centered on the problem								1	0.14*	0.00	0.15*	0.12	0.23**
9. Coping traditional teaching methods									1	0.00	−0.20**	−0.37**	−0.25**
10. Avoidance coping										1	0.00	0.11	0.16**
11. Emotional exhaustion											1	0.27	0.40**
12. Nonaccomplishment												1	0.36**
13. Depersonalization													1

$n = 259$.
* $p < 0.05$.
** $p < 0.01$.

stressors, perceived social support, perceived stress and coping strategies) explain 40% of the variance of burnout.

6.1. Effects of professional stressors

Some direct effects have been observed between the professional stressors of teachers and some of the criteria: between "conflicts and interpersonal problems" and emotional exhaustion (direct effect: 0.14, $p < 0.01$); between the "workload" and emotional exhaustion (direct effect: 0.17, $p < 0.01$) and professional nonaccomplishment (direct effect: 0.15, $p < 0.01$). Some significant indirect effects are also observed:[3] between the workload and emotional exhaustion (indirect effect: 0.10, $p < 0.01$); between inequity and emotional exhaustion (indirect effect: 0.09, $p < 0.05$). Perceived stress mediates the effect of the professional stressor on adjustment in the two cases.[4]

6.2. Effects of self-efficacy

Self-efficacy has a significant direct effect on the three facets of burnout (direct effect: −0.17, $p < 0.01$ for emotional exhaustion; −0.26, $p < 0.01$ for professional nonaccomplishment and −0.17, $p < 0.01$ for depersonalization). However, no significant indirect effect was observed.

6.3. Effects of social support

Social support does not have a direct effect on the three dimensions of burnout. However, two significant indirect effects are observed: on the lack of professional nonaccomplishment (−0.08, $p < 0.01$). Coping centered on the problem mediates this relationship.

6.4. Effects of perceived stress

Perceived stress has a positive direct effect on emotional exhaustion (direct effect: 0.28, $p < 0.01$) and a negative effect on depersonalization (−0.16, $p < 0.01$). Moreover, a significant indirect effect is observed between perceived stress and depersonalization (indirect effect: 0.06, $p < 0.05$). Coping centered on traditional teaching methods mediates this relationship.

6.5. Effects of coping strategies

Coping centered on the problem has a direct negative effect on the three facets of burnout (direct effect: −0.18, $p < 0.01$ for emotional exhaustion; −0.33, $p < 0.01$ for professional nonaccomplishment and −0.26, $p < 0.01$ for depersonalization).

Traditional teaching coping has a direct positive effect on the three facets of burnout (direct effect: 0.13, $p < 0.01$ for emotional

[3] For a review of the method of calculating indirect effects, see Rascle and Irachabal (2001).

[4] By mediator we mean the process by which the independent variable is susceptible to influence the dependent variable. In this case, the independent variable is the cause of triggering the action of a mediator or of its intensity, which itself influences the dependent variable (Rascle and Irachabal, 2001).

exhaustion; 0.20, $p < 0.01$ for professional nonaccomplishment and 0.27, $p < 0.01$ for depersonalization).

Avoidance coping has a direct positive effect on two of the three facets of burnout (direct effect: 0.12, $p < 0.01$ for professional nonaccomplishment and 0.13, $p < 0.01$ for depersonalization).

7. Discussion

Self-efficacy has a significant direct effect on the three facets of burnout. This result agrees with those of numerous earlier works which show the beneficial effects (the protective role) of this dispositional variable on physical and mental health (Bandura, 1997), particularly among teachers (Lee and Ashforth, 1990; Brouwers and Tomic, 2000). The protective effect of self-efficacy in regards to depersonalization can be understood insofar as perceived self-efficacy is associated with the feeling of being able to face adversity, which undoubtedly makes it possible to confront problems more easily and to invest more in the relationship with the students. If self-efficacy is negatively linked to burnout, it is undoubtedly due to the fact of believing that one can overcome difficult situations and reach objectives which enable one to avoid being "emptied" by one's work, a process which undoubtedly functions constantly, with one reinforcing the other (Brouwers and Tomic, 2000). As for the relation between self-efficacy and professional accomplishment, one can think that teachers with high self-efficacy will have the impression of reaching their goals and of being fulfilled by their jobs (Lee and Ashforth, 1990). Moreover, it should be noted that in our population, generalized self-efficacy seems to influence the adoption of a coping strategy centered on the problem.

The frequency of stressful events (workload, conflicts, etc.) leads to emotional exhaustion, depersonalization of the relationship with the student (which corresponds to a reduction in the commitment to the pedagogical relationship and causing behavior characterized by indifference, coldness and insensitivity to others) and professional nonaccomplishment among teachers. A strong exposition to these difficulties leads both to a dulling of the emotional function and the development of a strategy of remoteness towards the students. When, for example, the workload is too heavy, the emotional spillover is overwhelming (perceived stress) which causes physical, emotional and intellectual fatigue. In the case of important conflicts with students, parents or the hierarchy, the lack of accomplishment and the loss of empathy which follow are reinforced by the nonuse of coping strategies centered on the problem (taking stock and rationalizing, objectively analyzing the situation, thinking about the positive aspects of teaching and encouraging the students).

"Perceived" stress is the subjective repercussion of difficulties (it is evaluated here in terms of intensity) and not their objective characteristics (called here "stressors" and evaluated in terms of frequency). On the one hand, as the results show, it is a dysfunctional transactional process insofar as it increases the risk of emotional exhaustion. On the other hand, it has no effect on professional accomplishment. However, its effect on depersonalization is paradoxical. Effectively, when perceived stress increases, depersonalization decreases. This result, which is contrary to all of the research on the subject, is relevant: firstly, it confirms the interest in differentiating the "real" from the "perceived" (it does not concern the same reality, etc.). But it also makes it possible to develop new hypotheses: that the teachers who invest the most in their jobs and who are very sensitive to the difficulties of the students are both the most stressed (subjectively) and the most implicated in their relationship (they "personalize" the relationship). Secondly, when teachers use coping centered on traditional teaching methods in response to the intensity of perceived stress, this only aggravates depersonalization (see below). Therefore, the teacher must find a good balance to maintain with a student, between depersonalization, professional implication and an overly strong relation. Again the teacher must be allowed to believe that he cannot resolve all of the students' problems, but that does not mean abandoning them.

Coping centered on the problem has functional effects on all of the facets of burnout which corroborate with the earlier results observed in the field of teaching and in other professional contexts (Brenner et al., 1985; Chan, 1998; Gana and Boblique, 2000; Litt and Turk, 1985; Needle et al., 1981). This strategy corresponds to putting problems into perspective (taking stock and rationalizing, objectively analyzing the situation, being coherent in one's relationship with the students) and to a positive attitude (thinking about the positive aspects of teaching, encouraging the students). The teacher's role as a mediator is essential insofar as he permits social support to be an effective resource against difficult professional situations. However, if one believes Smylie (1999), a teacher's isolation in relation to his hierarchy, his coworkers and the parents is undoubtedly one of the principal causes of teachers' ill-being. Not talking about what one experiences in class can be considered as a protection, but that appears to be completely ineffective in light of these results. It should be recalled that in our population, this strategy (as well as that of the need to communicate) is used less significantly by novice teachers. This result is hardly surprising to us because it is difficult to become integrated in already well-established teams during the first few years of teaching. All of the results emphasize the importance of carrying out a veritable support program for novice teachers.

Avoidance coping (completely forgetting work, not bringing work home, avoiding other teachers, ignoring problems, not working too hard) is a dysfunctional strategy in the sense that it has a positive direct effect on depersonalization and professional nonaccomplishment. However, it does not have an effect on burnout. It is hardly surprising that such a palliative strategy (withdrawal, attempting to forget one's problems) does not solve the problems and leads to a reduction in self-esteem and a distantness of the users (Chan, 1998; Conolly and Sanders, 1988; Gana and Boblique, 2000; Seidman and Zager, 1991).

Recourse to a traditional style of teaching also accentuates emotional exhaustion, depersonalization and professional nonaccomplishment. Traditional teaching methods favor relationships with the group-class taken as a homogeneous entity to the detriment of relationships with each child. It is easy to conceive that a teacher does not choose this attitude wholeheart-

edly, but only to protect himself and to deal with the situation. Such an attitude, defensive and rigid, is probably a source of frustration.

In short, only coping centered on the problem proves to be effective (it limits burnout) and two other strategies have a dysfunctional effect (avoidance, adopting a traditional style of teaching) among the teachers in our sample.

These results can suggest treatments intended for the most vulnerable teachers. However, we believe that it would be unrealistic to believe that one can act on the ill-being of teachers by optimizing their coping strategies without notably improving their working conditions. Hence we propose various complementary types of intervention which we have classed following customary taxonomy. Firstly, the primary interventions centered on the organization of work, the objective of which is to reduce job stressors and hence improve working conditions, then the primary interventions centered on the individual, which aim at increasing the personal resources of professionals. These are followed by secondary interventions which make it possible to improve strategies for coping with stress, and finally, tertiary interventions to be implemented when the process of burnout is already developed among professionals.

Regarding the first interventions, work must be done, of course, on the entire problem (on a macrosocial level) in order to improve the working conditions of teachers who, as we have seen, combine the students' difficulties with pressure from the hierarchy, the incessant demands of parents, the nonrecognition of their work and the spillover from society. But it is often on a microsocial level that the interventions are more effective. The principal's role is often essential in this approach, insofar as he provides the teacher with logistic or instrumental support, as well as support for improved self-esteem. In this sense, the adoption of a participative style on the part of the school principal is recommended in order to reduce teachers' stress.

Regarding the primary interventions centered on the individuals, it is recommended to intervene before the phenomenon of burnout, in the form of information programs on job stress or stress in general. These interventions, by means of videos, magazines, seminars or workshops, aim to spread information about the determinants of the burnout syndrome and its mechanisms, so that professionals will be aware of it and enable them to adopt preventive measures. The job of informing is particularly recommended at the beginning of a career, at a time when the image of the job is idealized and the novice adopts attitudes which put him in danger (overinvestment in the job). But in the framework of the recent movement in positive psychology (Seligman and Csikszentmihalyi, 2000), health programs of prevention with the aim of improving well-being and happiness can be applied to the job context. Techniques of improved self and professional esteem are recommended in order to reach this objective (Seligman et al., 2005). This type of program can emphasize the identification of situations (job content, interpersonal relations, etc.) which reinforces the feeling of self-efficacy and the positive affectivity of the employee, and thereby avoids burnout.

The secondary types of interventions can be developed with the precedent or when the former could not be realized or were ineffective. One of the objectives of these cognitive-behavioral techniques consists in identifying one's own adjustment strategies and evaluating their effectiveness for solving problems or reducing emotional tension in a stressful situation (see Rascle, 2001b), which can incite the personnel to adopt more functional strategies of the centered problem type as our results have shown. This type of intervention among professionals affected by burnout has been proved to be effective, even after one year (Schaufeli and Enzman, 1998). Support groups made up of peers (coworkers or supervisors) are also recommended in this type of intervention. Their aim is to analyze difficult job situations together, to express and share their problems, to break out of their isolation and abandon guilty feelings. They facilitate certain acquisitions such as searching for and adopting together certain solutions, and learning how to give and to get support. But these groups are only effective on the condition that they are not only centered on discharging emotions, and if the initiative comes from the professionals themselves (the Balint groups are an example). In keeping with this, talk groups for classes for scholastic integration (CLIS) teachers, mediated by school psychologists, were set up a year ago in the Tarn department in France. It is difficult to evaluate the benefits of these groups, but the teachers seem to be satisfied with this experiment and the number of participants is increasing.

Finally, the use of continuing education is also important in this type of intervention and it is well-known that teachers are lacking in this area. A training course on the interpersonal relation would permit teachers, notably the youngest, to better manage the emotions resulting from specific job demands, which is indispensable for avoiding burnout.

Regarding tertiary types of interventions, the services of occupational medicine as well as the management of human resources have an essential role to play in the diagnosis and in the treatment of a professional suffering from exhaustion. For example, exhausted teachers can be offered a second career. It is also possible to develop actions such as outplacement and redeployment (other jobs or other working conditions). Effectively, when the job only represents suffering for the individual, it is better to propose a job which will be a source of satisfaction and accomplishment whenever it is possible. But in light of the knowledge and the practices that we currently have at our disposal, it is unfortunate when the intervention is not done before arriving at that stage.

8. Conclusion

In spite of its limits, this research offers several interesting results. It resulted in the development and the validation of a questionnaire concerning specific stress for teachers whose psychometric qualities are satisfactory (Laugaa et al., 2005a). Moreover, the results of this study are completely compatible with the integrative model of stress proposed on Fig. 1. The principal independent variables of the model (self-efficacy, perceived stress, coping strategies) explain 40% of the variance of burnout. In addition, this study has made it possible to identify the principal coping strategies used by French teachers and to establish their beneficial or harmful effects. In other words, these

results confirm the impact of the classical predictors of adjustment (situational, dispositional), as well as the mediator effect of the transactional variables whose role seems to be essential here for understanding the dynamic and sequential aspect of the process of adjustment to aversive situations. We hope that this work will give rise to future research on stress, coping, support and burnout among French teachers, with theoretical aims as well as applications for treatment.

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