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MODERATOR EFFECTS OF SELF-EFFICACY ON OCCUPATIONAL STRESS

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This paper analyses self-efficacy as a moderator in the occupational stress process. Specifically, it analyses the complementarity between two self-efficacy measures: generalised and professional. The initial hypothesis was that specific self-efficacy will moderate more stress-strain relationships than generalised self-efficacy. Based on data collected from 140 workers that use new technologies in their jobs, we found that self-efficacy moderates the stress-strain relationship in general, in the sense that low levels of self-efficacy are related to high levels of occupational stress. The results of hierarchical multiple regression analyses show that general and professional self-efficacy are complementary as moderators in stress processes, depending on the specific strain studied. However, it was found that professional self-efficacy has more interaction effects. Specifically, we found that individuals with low levels of generalised self-efficacy show more emotional exhaustion when their job autonomy is higher, while those with low levels of professional self-efficacy show greater cynicism when routine and role conflict are high, and have low levels of organisational commitment when the level of role conflict is high. The increase in stressors is not associated with strain for workers with high levels of self-efficacy. Finally, the limitations of the study and implications of its findings are discussed.

Este trabajo analiza el rol modulador de las creencias de eficacia en el proceso de estrés laboral. En concreto se pretende estudiar la complementariedad entre dos medidas de autoeficacia: una generalizada y otra específica para el ámbito laboral. La hipótesis de partida es que la autoeficacia específica modulará más relaciones del estrés laboral y sus consecuencias que la autoeficacia generalizada. A partir de los datos obtenidos de 140 trabajadores que utilizan nuevas tecnologías en sus puestos, se constata que, en general, la autoeficacia modula las relaciones entre los estresores y sus consecuencias, en el sentido de que bajos niveles de autoeficacia están asociados a mayores niveles de estrés experimentado. Los resultados de los análisis de regresión múltiple jerárquica señalan que, aunque encontramos más efectos de interacción en el caso de la autoeficacia profesional, ambos tipos de autoeficacia son complementarias en cuanto a su rol modulador en los procesos de estrés, dependiendo su modulación del tipo de estresor y de la consecuencia de estrés específica considerada. En concreto encontramos que los trabajadores bajos en autoeficacia generalizada manifiestan mayor agotamiento emocional cuando la autonomía laboral es mayor; mientras que los trabajadores bajos en autoeficacia profesional manifiestan mayores niveles de cinismo cuando la rutina y el conflicto de rol son altos, y menores niveles de compromiso organizacional cuando tienen niveles elevados de conflicto de rol. Para los trabajadores altos en niveles de autoeficacia, tanto generalizada como específica, valores altos de los estresores no están asociado con consecuencias negativas del estrés. Finalmente se analizan las limitaciones de este estudio y las implicaciones que se derivan de los resultados.

The majority of occupational stress models propose that stressors in the occupational environment generate negative changes in the individual, in physical, psychological and behavioural terms (Beehr, 1995). These models also suggest that the relationship between stressors and their negative consequences (strain) is moderated by different factors, such as demographic characteristics, personality features, social environment, etc. Research on occupational stress has tried to show these moderating relationships, highlighting the need to study more personal variables as potential moderators in the stress-strain relationship. (De Rijk, LeBlanc, Schaufeli & De Jong, 1998; Heinisch & Jex, 1997; Jex & Bliese, 1999; Jex & Elacqua, 1999; Parkes, 1990).

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Self-beliefs and self-efficacy

One's beliefs about oneself can act as moderating variables in the stress-strain relationship. These beliefs have been considered in other areas within organisational psychology, showing for example the moderating effects of self-esteem on the results of teamwork (Brief & Aldag, 1998). Other results have supported the idea that stressors have a less negative effect when individuals have more positive self-perceptions (Mossholder, Bedein & Armenakis, 1982).

One type of belief that has received considerable attention in the research is self-efficacy. According to Bandura (1997), perceived self-efficacy refers to beliefs in one's own capacity to organise and execute the courses of action required to manage prospective situations. The principal source of self-efficacy is *enactive mastering,* which depends on both real and perceived execution of the task. Other sources of self-efficacy are the verbal persuasion of others, vicarious learning and emotional activation. Research shows that one's own beliefs of efficacy function as an important determinant of motivation, affect, thought and action (Bandura, 1992).

According to Schwarzer (1999) self-efficacy can make a difference to people's ways of thinking feeling and acting. With respect to feelings, a low sense of self-efficacy is associated with depression, anxiety and helplessness. People with low self-efficacy also harbour pessimistic thoughts about their performance and personal development. In contrast, a strong sense of belief in oneself facilitates cognitive and executive processes in multiple contexts, influencing, for example, decision-making and academic achievement. (Bandura, 1995; Schwarzer, 1999).

Levels of generality in self-efficacy

Researchers have conceptualised generalised self-efficacy as the confidence in one's own coping skills that is manifested in a wide range of challenging situations, and which has a broad and stable nature (Schwarzer, 1999). Nevertheless, the degree of generality may vary depending on the different results it is intended to predict or moderate, such as the degree of similarity of the activities, the modalities or forms in which the skills manifest themselves (behavioural, cognitive and affective), and qualitative aspects of the situation.

According to some authors, self-efficacy as general capacity seems to be a better predictor of performance than specific self-efficacy. Other studies show that the two types of self-efficacy (generalised and specific) are positively related, and may act in a complementary way (Jex & Bliese, 1999; Watt & Martin, 1995). Nevertheless, other authors point out the need to develop measures of specific skills in specific populations (Maibach & Murphy, 1995; Bandura, 1997).

Self-efficacy as a specific construct has been understood as the belief about level of competence in particular situations. For example, in the field of work, Cherniss (1993) introduced the concept of professional self-efficacy, understood as belief in the ability to correctly fulfil one's professional role, and operationalised it using the *Maslach Burnout Inventory-General Survey* (MBI-GS Schaufeli, Leiter, Maslach & Jackson, 1996). The results are borne out in the meta-analysis carried out by Lee & Ashforth (1996). Furthermore, the professional self-efficacy dimension reflects a personality characteristic closer to the concept of self-efficacy than to a genuine component of the burnout reaction (Cordes & Dougherty, 1993; De Rijk *et al.* 1998).

The moderating role of self-efficacy

Since its conception, self-efficacy has been applied to different contexts (Bandura, 1977, 1982, 1997). This author has pointed out that self-efficacy is related to better health, better self-development and greater social integration. In the work context, for example, Speir & Frese (1997) studied generalised self-efficacy, showing that self-efficacy functions as a mediator in the relationship between control and initiative when the latter is concurrent, and as a moderator when the personal initiative (PI) is retrospective. Other authors (Bandura, 1997; Jex & Bliese, 1999; Schwarzer, 1999) consider, moreover, that self-efficacy is relevant in the study of stress and work, fulfilling a moderating role. The basis for this is found on considering control as a key factor in the stress process, so that the mere exposure to stressors, with control by the subject has no adverse effects. On the other hand, exposure to stressors occurs without control on the part of the subject may lead to undesired or harmful effects. In this way, Bandura's *Cognitive Social Theory* considers the experience of stress in terms of low efficacy for exercising control over stressful situations or conditions.

In spite of the above, little research has been carried out on the role of beliefs of efficacy in the processes of occupational stress (Jex & Bliese, 1999). Among the few studies that have explored such questions directly are those of Jex & Gudanowski (1992) and Jex & Bliese (1999). While the former find no empirical evidence of a moderating role of self-efficacy in the processes of occupational stress, the latter was more successful. Jex & Bliese (1999), using two self-efficacy measures (generalised-individual and collective), point out that self-efficacy moderates the relationship between certain stressors, such as number hours worked,

work overload or task meaning, and some of their consequences, such as satisfaction, physical symptoms, attempts to abandon the job and organisational commitment.

With respect to the specific consequences of stress, these authors found that generalised self-efficacy has a strong positive relationship with job satisfaction (main effect of the moderating variable). Among the main effects of stressors, they found that two of the three stressors studied (work overload and low levels of task meaning) are significantly associated with job satisfaction. However, they did not find significant interaction effects as far as job satisfaction was concerned. They found a similar pattern in relation to organisational commitment, but in this variable there does appear to be a significant interaction effect between generalised self-efficacy and work overload. Thus, organisational commitment stays relatively high for people with high levels of generalised self-efficacy, even under conditions of high overload, while this is not the case for those with low self-efficacy, who show lower levels of organisational commitment, which fall even more as work overload increases.

Objectives and hypotheses

The aim of this study is to analyse the moderating roles of generalised self-efficacy and professional self-efficacy in the relationships between some aspects of work, relating to the task and to the social context, that can be perceived as stressors (level of job autonomy, social support climate, routine in tasks, and role conflict), and their consequences (burnout, job satisfaction and organisational commitment).

In this article we shall make a series of contributions to previous research in this area. First of all, we shall increase the number of stressors to those found in the employee's social environment. Previous studies (Jex & Gudanowski, 1992; Jex & Bliese, 1999) only considered stressors related to the task (work overload, hours of work and meaningfulness of the task) to analyse the moderating role of self-efficacy. We also take into account the (lack of) social support climate and role conflict as possible stressors.

Secondly, we enlarge the type of stressors to take into account not only demands (role conflict, routine) but also (the lack of) resources. The implicit assumption is that the lack or excessive presence of resources is associated with stressful consequences in individuals with low self-efficacy. Another explanation more in line with Bandura's (1997) theory is that self-efficacy has a strong effect on the degree to which workers want more responsibility and new challenges in their jobs. People with low levels of self-efficacy do not feel comfortable in jobs with such characteristics. Thus, it is to be expected that such people would not react as favourably to high levels of autonomy in their job as people with high self-efficacy. Self-efficacy, then, determines to a certain extent whether or not autonomy is perceived as a stressor.

Thirdly, we also employ a broader perspective on the consequences of stress, taking into account the moderating role of self-efficacy in relationships between stress and professional burnout. Specifically, we study the consequences on emotional exhaustion and cynicism, these being considered as the "core of burnout" (De Rijk *et al.* 1998). Many studies have shown that burnout is a consequence of maintaining a stressful situation for a long period of time (for a broad review, see Gil-Monte & Peiró, 1997 and Schaufeli & Enzman, 1998). Nevertheless, we did not find specific studies on the moderating role of self-efficacy in burnout. The present study aims to increase our understanding of these relationships, on the expectation that both dimensions of burnout will be positively associated with high levels of stressors in people with low levels of self-efficacy.

Finally, we test two models of moderation, taking into account two levels of generality of self-efficacy, generalised and professional. The first is more general and related to stable personality features. The second is more specific and focused on work contexts. Basing our work on the literature reviewed, we propose the following hypotheses:

Hypothesis 1: In terms of demands**,** we expect high levels of routine and role conflict to be associated with higher levels of emotional exhaustion and cynicism, as well as a lack of satisfaction and organisational commitment.

Hypothesis 2: In terms of resources, we expect autonomy and social support climate to be negatively associated with burnout and positively associated with job satisfaction and organisational commitment

Hypothesis 3: Regarding the relationship between self-efficacy (generalised and specific) and the consequences

of stress, it is expected that low levels of self-efficacy will be significantly associated with high levels of burnout and low levels of job satisfaction and organisational commitment.

Hypothesis 4: We expect that self-efficacy will moderate the occupational stress-strain relationship. That is, we assume that routine, lack of autonomy and social support climate, and role conflict will be significantly linked to the consequences of stress only in those workers with low levels of self-efficacy.

Hypothesis 5: Finally, regarding the level of generality of self-efficacy, we expect professional self-efficacy to moderate the occupational stress-strain relationship more strongly than generalised self-efficacy.

METHOD

Procedure and participants

Questionnaires were given to 140 workers in five companies from 5 different socio-economic sectors, selected according to the criteria of experts. All the workers were using new technologies in their jobs, which included telecommunications technologies applied to administrative jobs (e.g., new software) and to production processes (e.g., computer-assisted numerical control). Age range was 22 to 56, with a mean of 33 (SD = 8.05). 54% of were men and 46% women.

Measures

Independent variables

The four stressors studied are routine, role conflict, (lack of) social support climate, and (lack of) job autonomy. Routine and job autonomy are aspects related to task characteristics, while conflict and climate refer to the social context. Furthermore, autonomy and climate are considered as *resources*, while routine and role conflict as *demands*.

Routine was measured using a 5-item questionnaire (Salanova, 1999). An example of the items for this scale is *"My job is routine and repetitive"*. Subjects were asked to indicate the extent to which these items described their current job, on a scale of five possible responses from *"That's a perfect description"* to *"That's absolutely wrong"*. The alpha coefficient is 0.79.

Role conflict was measured on a scale of 8 items developed by Rizzo, House & Lirtzman, (1970). A representative item on the scale is *"I receive contradictory requests or information from two or more people."* Possible responses are similar to those for the *routine* measure, and reliability, also measured by means of alpha, is 0.90.

Social support climate at work was measured by a questionnaire composed of 6 items (FOCUS, 1984), for example *"How often do the managers in your company show concern for the personal problems of their employees?"* These items were scored on a seven-point Likert scale ranging from "never" to "always". The alpha is 0.82.

The *job autonomy* measure is a combination of two types of job autonomy: task autonomy (measured by the Van de Ven & Ferry questionnaire, 1980; alpha = 0.85) and time autonomy (measured by the Jackson *et al* questionnaire, 1993; alpha = 0.86). The global dimension has an alpha of 0.91. An example of a task autonomy is *"autonomy to determine which tasks I carry out every day"*, and an item of time autonomy is *"autonomy to determine the order in which I do the tasks"*. Answers were scored on a 5-point Likert scale, ranging from (1) "none" to (5) "a great deal".

Dependent variables

Four variables were used to measure the consequences of stress: emotional exhaustion and cynicism (dimensions of burnout), job satisfaction and organisational commitment.

To measure *emotional exhaustion and cynicism,* two sub-scales of the MBI-GS (Schaufeli et al, 1997) were used, comprising a total of 10 items. The emotional exhaustion sub-scale consists of 5 items (e.g., *"I'm emotionally exhausted by my work"*). The cynicism sub-scale also comprises five items in the original version (e.g., *"I have become more cynical about the usefulness of my work"*), but one item from the original scale was eliminated due to its insufficient factorial validity. Workers were required to answer on a scale of 6 points (from "never" to "every day"). The alpha value for the emotional exhaustion sub-scale is 0.82, while the value for cynicism is 0.86.

As a measure of *job satisfaction* an extended version of the Peiró and Meliá (1989) questionnaire was used. To this questionnaire were added 8 items measuring intrinsic satisfaction, and satisfaction with the use of new technologies (Salanova, 1999). In this questionnaire subjects were asked about their level of satisfaction in relation to, for example, *"the autonomy I have in my*

job". Subjects responded on a seven-point Likert scale that ranged from "very dissatisfied" to "very satisfied". Global alpha value is 0.93.

Organisational commitment was measured using the Cook & Wall scale (1980), made up of 9 items, for example *"I feel that I'm part of the company"*. The scale of responses ranged from "I disagree completely" to "I agree completely". Alpha is 0.81.

Moderator variables

We considered two measures of efficacy beliefs: generalised self-efficacy and specific self-efficacy with respect to one's own job, that is, professional self-efficacy. *Generalised self-efficacy* was measured with the Spanish version of Schwarzer's (1999) questionnaire, comprising 10 items. One example of an item is *"I can resolve difficult problems if I make sufficient effort"*. Employees mark their level of agreement or disagreement on a 5-point Likert scale from "never" to "many times". The alpha is 0.81.

As far as *professional self-efficacy* is concerned, this was measured using the professional efficacy dimension of the MBI-GS (Schaufelí *et al.* 1997), with 6 items (e.g., *"I can solve problems that come up at work in an effective way"*). The response scale was the same as that of emotional exhaustion and cynicism sub-scales described above. The alpha is .70.

Data analysis

Moderated regression analysis, as the recommended method for testing interaction effects, were used (Cohen & Cohen, 1983; Landsbergis, Schnall, Warren, Pickering & Schwartz, 1994; Zedeck, 1971). Hierarchical multiple regression analyses were performed to detect main effects and interaction effects of job autonomy, social climate, routine and role conflict and the two moderator variables (generalised self-efficacy and professional self-efficacy) on each one of the stress consequence measures. In order to test interaction effects, multiplicative terms were created for the standardised independent variables (cf. Cohen & Cohen, 1983; Kleinbaum, Kupper & Muller, 1988).

The standardised independent variables were introduced into the equation in four successive steps (cf. Aiken & West, 1991; Jaccard, Turrisi & Wan, 1990). In the first step (1), age and sex were introduced to control their possible influence. Next (2), autonomy, social climate, routine and role conflict, followed by (3), the moderator variable (generalised or professional self-efficacy), and finally (4), the two-way interactions (autonomy x moderator, climate x moderator, routine x moderator and role conflict x moderator). The significant interaction effects would support Hypothesis 4. Nevertheless, we also take into account the main effects, given that, as Jaccard *et al.* (1990) point out, the main effects of the independent variables generally constitute significant information. The significant main effects would support Hypotheses 1 and 2.

Finally, the significant main effect of the moderator variable supports Hypothesis 3. The difference of R^2 and of the changes in R^2 in both moderator models (using generalised and professional self-efficacy each time) would support Hypothesis 5, suggesting that professional self-efficacy moderates the link between stress and its consequences to a greater extent than generalised self-efficacy.

In all, eight hierarchical multiple regression analyses

Table 1
Descriptive statistics for the variables of the study (*N*=140)

Variables	Ranges	∝	*M*	SD	2	3	4	5	6	7	8	9	10	11	12
1. Age	20-56	33	8.05	- -	-24**	-.06	-.09	.20*	.34**	-.07	-.24**	-.14	.10	.12	-.11
2. Sex	1-2	1.40	0.50	- -	- -	-.16	.01	.35**	-.37**	-.06	-.03	-.04	.08	.14	-.08
3. Job autonomy	1-5	3.62	0.90	.91	- -	- -	.27**	-.33*	-.10	.17*	.24**	.38**	-.14	-.28**	.21**
4. Support climate	1.5-7	4.15	1.07	.82	- -	- -	- -	-.30**	-.24**	.18*	.28**	.52**	-.25**	-.38**	.52**
5. Routine	1.17-5	2.70	0.84	.80	- -	- -	- -	- -	.30	-.30**	-.40**	-.42**	.23**	.35**	-.34**
6. Role conflict	1-4.38	1.90	0.74	.78	- -	- -	- -	- -	- -	.14	-.15	-.43**	.36**	37**	-.25**
7. Generalised self-efficacy	2.4-5	4.00	0.48	.86	- -	- -	- -	- -	- -	- -	.40**	.26**	-.13	-.07	22**
8. Professional self-efficacy	1.8-6	4.70	0.76	.70	- -	- -	- -	- -	- -	- -	- -	.40**	-.25**	-.47**	.41**
9. Job satisfaction	1.53-7	5.09	0.99	.93	- -	- -	- -	- -	- -	- -	- -	- -	-.36**	-.60**	.57**
10. Emotional exhaustion	0-6	1.80	1.03	.82	- -	- -	- -	- -	- -	- -	- -	- -	- -	.53	-.31**
11. Cynicism	0-6	1.07	1.23	.86	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	-.52**
12.Organisational commitment	3.3-7	5.09	0.75	.75	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -

*p<=.05; **p<=.01

were carried out (four analyses for each dependent variable, separately for each moderator). To interpret the standardised variables *a priori*, unstandardised regression coefficients (B) (cf. Aiken & West, 1991) are presented in Tables 2 to 5. Finally, the significant interaction effects are represented graphically, following the procedures of Cohen & Cohen (1983) and Jaccard *et al*. (1990). Specifically, separate lines of regression were generated from the regression equation to represent the stress-strain relationship at relatively high (+1 SD) and relatively low (-1 SD) levels of the moderator variable.

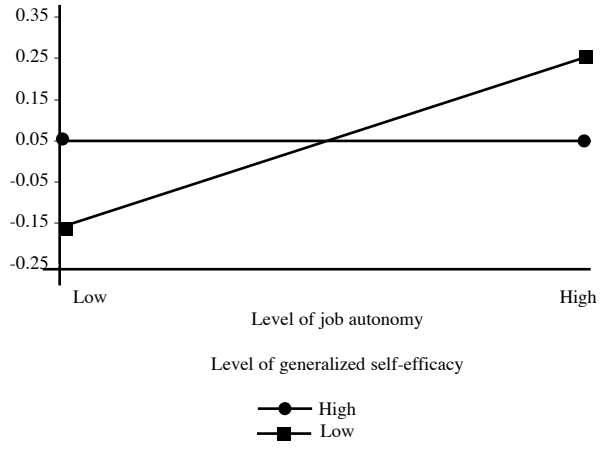
Table 2
Hierarchical multiple regression analysis of stressors and generalised self-efficacy and professional self-efficacy on emotional exhaustion (N= 140)

	Generalised self-efficacy		Professional self-efficacy	
Moderators	ß	R^2	change B	R^2 change
1. Age	-.18*	.01	-.12	.01
Sex	.14		.18	
2. Job autonomy	.01	.25**	.01	.25***
Support climate	-.14		-.13	
Routine	.07		.07	
Role conflict	.54***		.47***	
3. Moderator	-.20*	.02*	-.11	.01
4. Autonomy x moderator	-.16*	.03	-.04	.01
Climate x moderator	.09		-.01	
Routine x moderator	-.05		.04	
Conflict x moderator	.06		.07	
R multiple	.58		.53	
R^2	.32		.28	
F	5.03***		4.12***	

*p<=.05; **p<=.01; ***p<=.001

Note: the ß values are the unstandardised coefficients obtained in the final state of the regression analysis

Figure 1
Two-way interaction effect of job autonomy and generalised self-efficacy on emotional exhaustion



RESULTS

Table 1 shows the empirical ranges, the means, standard deviations, alpha coefficients and zero-order Pearson correlations of the variables considered in the study. All the alpha coefficients show reasonable internal consistency, with all of them above the 0.70 recommended (Nunnaly, 1978). The direction of the correlations coincides with that expected from the literature reviewed. Furthermore, the two self-efficacy measures are significantly correlated in a positive direction (r=.40; p<0.01)

Regression analysis

Emotional exhaustion. For each moderator variable a hierarchical multiple regression analysis was performed separately (see Table 2). The main effects of the independent variables and the moderator variable of generalised self-efficacy were significant once we take into account the change of R^2. However, when we examine individual effects, only the case of main effect due to role conflict is significant in the expected direction, in both moderation models. Thus, high levels of role conflict are positively associated with high levels of emotional exhaustion. Furthermore, low levels of generalised self-efficacy are associated significantly with high levels of emotional exhaustion.

As regards interaction effects, the change of R^2 does not reach the conventional level of significance. Nevertheless, we did find a significant interaction effect (ß= -.16; p<0.05) due to the interaction effect of autonomy and generalised self-efficacy.

Figure 1 represents the interaction effect following the method recommended by Aiken and West (1991) and Jaccard *et al.* (1990). Values of the moderator variable were chosen at 1 SD above and below the mean. Simple regression lines were generated to introduce these values into the regression equation. In this way we can see that workers with high levels of generalised self-efficacy have constantly low levels of emotional exhaustion, irrespective of whether levels of autonomy are low or high. This is not the case for workers with low levels of generalised self-efficacy, since their emotional exhaustion rises as levels of job autonomy increase.

Finally, if we take into account R^2 in both models of moderation, we can see that in the case of generalised self-efficacy this value is greater than that obtained for professional self-efficacy. Thus, in the case of emotional exhaustion, generalised self-efficacy is a stronger mode-

rator of relationships between stressors and the experience of burnout.

In sum, for emotional exhaustion Hypothesis 1 is partially confirmed for the case of role conflict, Hypothesis 2 is not confirmed, Hypotheses 3 and 4 are partially confirmed, and Hypothesis 5 is not confirmed.

Cynicism. The pattern of results for cynicism is quite different depending on which regression analysis is considered. In the case of generalised self-efficacy, we see only significant main effects due to some independent variables, and not the main effect due to the moderating variable, nor the interaction effects (see Table 3). Regarding professional self-efficacy, the results show significant main effects due to some independent variables and to the moderator variable, as well as significant interaction effects. Low levels of social support climate and high levels of role conflict are associated significantly with high levels of cynicism. Finally, low levels of professional self-efficacy are associated significantly with high levels of cynicism.

As far as the interaction effects are concerned, the results (Figure 2) show that professional self-efficacy moderates the relationships between routine and cynicism. Routine is more related to cynicism in employees with low levels of professional self-efficacy. Although levels of cynicism increase slightly with a rise in routine for employees with high levels of professional self-efficacy, the increase is not as marked as in the previous case.

Role conflict presents a pattern of results similar to the previous case. Role conflict is associated with cynicism in the case of workers with low levels of professional self-efficacy. For employees with high levels of self-efficacy, increases in the stressor are not related to greater cynicism (see Figure 3).

In both regression analyses we find a significant effect of sex on cynicism. Women seem to have higher degrees of cynicism than men. Nevertheless, the results of an ANOVA with sex as independent variable and cynicism as the dependent variable shows that there are no significant differences (F= 2.96; p= .09).

Finally, if we look at R^2 in both models, we can observe that in the case of professional self-efficacy the value is greater than for generalised self-efficacy.

Summarising, in terms of cynicism, Hypothesis 1 is partially confirmed in the case of role conflict in both models, and in the case of routine in the generalised self-efficacy model. Hypothesis 2 is also partially confirmed in the case of social support climate in both models, but not for job autonomy. Hypothesis 3 is confirmed for professional but not for generalised self-efficacy, since the latter is not significantly associated with cynicism. With regard to Hypothesis 4, this is confirmed once again in the case of professional but not of generalised self-efficacy, as we could not find significant interaction effects. Finally, Hypothesis 5 is also confirmed for cynicism, as the R^2 value is higher for professional self-efficacy than for generalised self-efficacy.

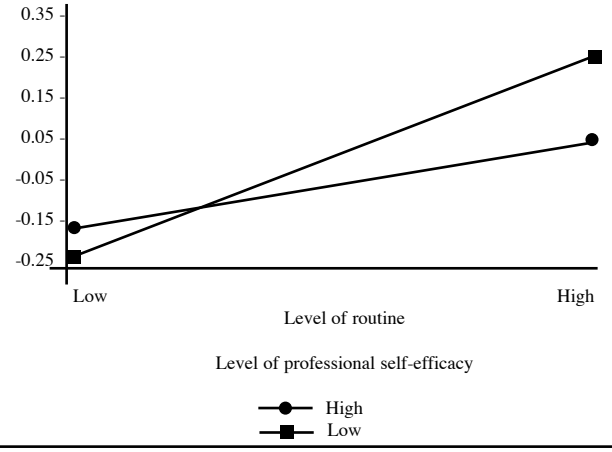
Table 3
Hierarchical multiple regression analysis of stressors and generalised self-efficacy and professional self-efficacy on cynicism
(*N*= 140)

	Generalised self-efficacy		Professional self-efficacy	
Moderators	ß	R^2	change B	R^2 change
1. Age	-.01	.05*	-.09	.05*
Sex	.22**		.18*	
2. Job autonomy	- .09	.29***	-.12	.29***
Support climate	- .26**		- .28***	
Routine	.18*		.06	
Role conflict	.31***		.28***	
3. Moderator	.05	.01	-.23**	.05***
4. Autonomy x moderator	.10	.03	-.13	.06**
Climate x moderator	-.03		.09	
Routine x moderator	.18		-.15*	
Conflict x moderator	-.14		-.24**	
R multiple	.62		.68	
R^2	.38		.47	
F	6.68***		9.51***	

*p<=.05; **p<=.01; ***p<=.001

Note: the ß values are the unstandardised coefficients obtained in the final state of the regression analysis

Figure 2
Two-way interaction effect of routine and professional self-efficacy on cynicism



Job satisfaction. The results relating to job satisfaction show a pattern very similar to that obtained in the case of emotional exhaustion. All the stressors are significantly associated with job satisfaction in the expected direction. Thus, low levels of autonomy and support climate, and high levels of routine and role conflict are associated significantly with low levels of job satisfaction.

In the regression analysis performed with generalised self-efficacy as moderator, the results show that it also has a significant main effect. Thus, high levels of generalised self-efficacy are significantly associated with high levels of satisfaction. This is not the case for professional self-efficacy, where the main effect of this variable is not significant.

Furthermore, we failed to find significant interaction effects in either of the two regression analyses carried out with job satisfaction as dependent variable. Finally, there are no differences in the R^2 of the two moderation models.

To sum up, for job satisfaction Hypotheses 1 and 2 are confirmed in the expected direction and Hypothesis 3 is confirmed for generalised self-efficacy, while Hypothesis 4, where we expected significant interaction effects, is not confirmed. Nor is Hypothesis 5, where we expected a stronger result for professional self-efficacy, supported.

Table 4
Hierarchical multiple regression analysis of stressors and generalised self-efficacy and professional self-efficacy on job satisfaction (N= 140)

	Generalised self-efficacy		Professional self-efficacy	
Moderators	ß	R^2	change B	R^2 change
1. Age	.01	.03	.04	.03
Sex	-.14		-.06	
2. Job autonomy	.17**	.46***	.16*	.46***
Support climate	.29***		.28***	
Routine	-.21**		-.23**	
Role conflict	-.35***		-.32***	
3. Moderator	.14*	.01*	.12	.01
4. Autonomy x moderator	-.04	.01	-.05	.01
Climate x moderator	-.02		-.01	
Routine x moderator	-.01		.01	
Conflict x moderator	-.04		-.03	
R multiple	.72		.72	
R^2	.52		.51	
F	11.45***		11.34***	

*p<=.05; **p<=.01; ***p<=.001

Note: the ß values are the unstandardised coefficients obtained in the final state of the regression analysis

Table 5
Hierarchical multiple regression analysis of stressors and generalised self-efficacy and professional self-efficacy on organisational commitment (N= 140)

	Generalised self-efficacy		Professional self-efficacy	
Moderators	ß	R^2	change B	R^2 change
1. Age	-.01	.03	.03	.03
Sex	-.10		-.10	
2. Job autonomy	.02	.33***	.01	.33***
Support climate	.43***		.43***	
Routine	-.11		-.06	
Role conflict	-.17*		-.12	
3. Moderator	.13	.01	.25**	.04**
4. Autonomy x moderator	.03	.02	.03	.05*
Climate x moderator	.03		.07	
Routine x moderator	-.12		-.11	
Conflict x moderator	.05		.13*	
R multiple	.63		.67	
R^2	.40		.46	
F	7.27***		8.95***	

*p<=.05; **p<=.01; ***p<=.001

Note: the ß values are the unstandardised coefficients obtained in the final state of the regression analysis

Organisational commitment. The results relating to organisational commitment display a very similar pattern to those for cynicism, but in the opposite direction (see Table 5). That is, the results are different depending on the moderator variable. As in the case of cynicism, the regression analysis carried out with generalised self-efficacy only shows significant main effects of the independent variables, but not a significant main effect of the moderator variable nor significant interaction effects. Thus, low levels of social support climate and high levels of role conflict are significantly associated with low levels of organisational commitment.

On considering professional self-efficacy as moderator, we find significant effects due to independent variables and moderator variables, as well as significant interaction effects. Thus, high levels of social support climate are significantly associated with high levels of organisational commitment. Furthermore, high levels of professional self-efficacy are also significantly associated with high levels of organisational commitment. Figure 4 shows graphically the significant interaction effect for role conflict x professional self-efficacy. In general, organisational commitment decreases as role conflict increases, though this reduction is much greater for workers with low levels of professional self-efficacy.

DISCUSSION

The aim of this study was to analyse the moderating role of generalised self-efficacy and professional self-efficacy in relationships between some aspects of work, relating both to task and social climate, that can be per-

ceived as stressors (job autonomy, social support climate, task routine and role conflict) and their consequences, such as burnout (emotional exhaustion and cynicism), job satisfaction and organisational commitment. Generally speaking, the results support the hypothesis that self-efficacy moderates the stress-strain relationship. However, the moderation depends on the level of generality of self-efficacy (generalised and specific), on the nature of the stressors (task-related or social), on the type of job characteristic (resource or demand) and on the type of stress consequence (burnout, job satisfaction or organisational commitment). These results are similar to those obtained by Jex & Gudanowski (1992) and Jex & Bliese (1999), who conclude that the moderation of self-efficacy depends on the specific stress-consequence relationship under examination.

In this study we have attempted to increase knowledge of the moderating role of personal characteristics (self-efficacy) in the stress process. The results confirm that, in general, stressors have a less negative impact on individuals when these have more positive perceptions about themselves, and more specifically high levels of self-efficacy. These results are in line with the contributions of Bandura (1997), Bheget & Allie (1989) and Schwarzer (1999), and with the research in occupational stress that has attempted to show the moderating relationships of personal variables (that is, locus of control, need for control, active coping, etc.) in stress processes (De Rijk *et al.* 1998; Heinisch & Jex, 1997; Jex & Bliese, 1999; Jex & Elacqua, 1999; Parkes, 1990).

In the present study, we have also expanded the type of stressors to include some of a social nature (social support climate and role conflict), as well as the traditional task-related stressors (routine and lack of job autonomy). Social support climate has an important predictive role in the majority of the consequences of stress analysed (that is, cynicism, job satisfaction and organisational commitment). Nevertheless, we found interaction effects of this stressor with the two types of self-efficacy. Social climate by itself is perhaps sufficiently relevant in explaining the way in which employees experience their exposure to stressors, whatever their level of self-efficacy.

Role conflict proves to be an important variable as a perceived stressor (demand of a social nature). In addition to its direct effect on the consequences of stress, we also found interaction effects with professional self-efficacy when predicting cynicism and organisational commitment. Workers with low levels of professional self-efficacy display greater cynicism and less organisational commitment when levels of role conflict are higher.

A further contribution of our study has been the consideration not only of demands (routine and role conflict) but also of resources (job autonomy and social support climate) as potential stressors. Increases in demands are generally associated with greater stress consequences. Furthermore, lack of resources also tends to be associated with negative experiences. In the present study we analysed the extent to which these relationships are moderated by self-efficacy. Our

Figure 3
Two-way interaction effect of role conflict and professional self-efficacy on cynicism

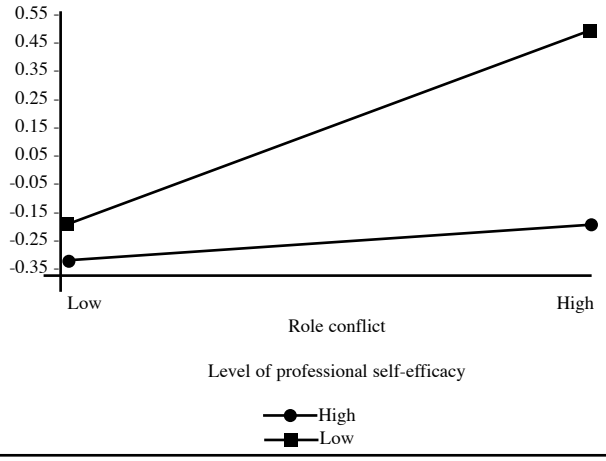
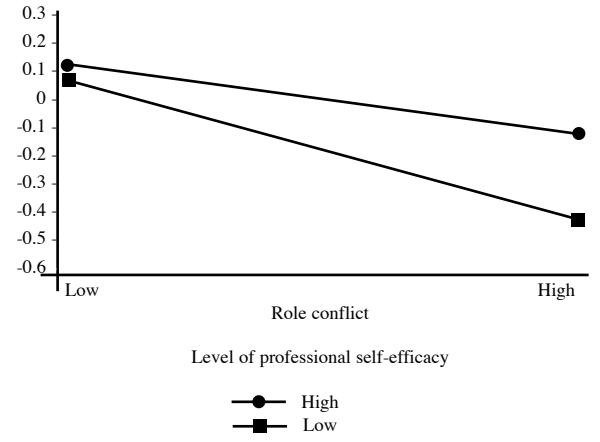


Figure 4
Two-way interaction effect of role conflict and professional self-efficacy on organisational commitment



results support those obtained by Bandura (1997) and Matsui & Onglato (1997). Job autonomy is thus positively and significantly associated with a greater degree of emotional exhaustion, but only among those employees that display low levels of self-efficacy. Generally, jobs with greater autonomy involve greater responsibility, more independent action, greater challenges, and so on. Thus, although in a general sense job autonomy is a positive feature, employees that consider themselves not very good at doing things well see autonomy as a demand, rather than a resource, displaying greater *emotional exhaustion* as levels of autonomy in their jobs increase. In this sense, Matsui & Onglato (1997) found that levels of self-efficacy may influence individuals in their preferences for different types of jobs and work environments. Thus, workers with high levels of self-efficacy work better in jobs where the consequences of error are high, or where role requirements are ambiguous. Workers with low levels of self-efficacy, on the other hand, find these jobs *stressful*. Bandura (1997) also points out that workers with high levels of self-efficacy feel better in challenging jobs and those that involve responsibility, and that the opposite is the case for employees with low self-efficacy levels.

Our study also provides relevant information about the moderating role of self-efficacy among stressors and professional burnout. Specifically, we analysed the effects of stress on emotional exhaustion and cynicism (considered to be "the core of burnout"). Results show that self-efficacy moderates the relationship between stress and its consequences in relation to burnout. Thus, employees with low levels of self-efficacy feel more "burnt out". However, the moderation of self-efficacy depends both on its level of generality (generalised or professional) and on the specific dimension of burnout. Thus, for example, generalised self-efficacy has stronger effects on the moderation stress-emotional exhaustion (for the case of autonomy), while professional self-efficacy has stronger effects on the moderation stress-cynicism (in the case of routine and role conflict).

Finally, our study has allowed us to test two models of moderation of the stress-strain relationship, taking into account two levels of generality of self-efficacy, that is, generalised self-efficacy and self-efficacy specific to work. The results suggest that, in a general sense, self-efficacy is an important variable in the study of organisational stress. The two types of self-efficacy studied, general and professional, have been related to occupational stress, in line with models of stress based on cognitive perspectives (Lazarus & Folkman, 1984). These relationships suggest that employees react negatively when they perceive that they cannot carry out their work adequately, and that higher self-efficacy can be a coping strategy in the stress process.

More specifically, the results show that although the two levels of self-efficacy are strongly related to one another, they have differentiated effects (direct as well as moderated) depending on the stressor and type of stress consequence. Generalised self-efficacy has a greater effect on job satisfaction and emotional exhaustion, while professional self-efficacy has a greater effect on cynicism and organisational commitment. Thus, although in general terms we find more significant interaction effects when professional self-efficacy is moderating, we cannot argue that it is more relevant as a moderator in the stress-strain relationship. These results are congruent with those obtained by Jex & Bliese (1999) and by Watt & Martin (1995) showing that the two types of self-efficacy are positively related and may have diffeerent effects. Future studies should validate these results using similar and different stressors and consequences of stress.

Limitations of the study

First of all, the data in this study was obtained using self-report measures, and the results may be contaminated by the variance of the common method. It would be appropriate to complement these measurements with others obtained with different methods.

Furthermore, the sample is made up of employees that use new technologies, and this could influence the results in some way. Working with new technologies involves the use of skills and abilities of a more cognitive and mental nature, and some results may have been conditioned by this fact.

Finally, the size of the sample may not have had sufficient statistical power for the moderating effects of self-efficacy. In some cases we found non-significant interactions between stressors and self-efficacy explaining 1-2% of variance in the results. This suggests that there may have been some moderating effects, even though they were small.

Implications

A variety of implications emerge from the results of the present study. When stressful situations are difficult to control for the organisation, prevention strategies could include the improvement of employees' self-efficacy, for example through training programmes designed to enhance self-efficacy, specifically professional self-efficacy. Bandura (1997) has already described strategies to increase self-efficacy: active domain, verbal persuasion, vicarious learning and emotional activation. Our study suggests that high levels of self-efficacy can help workers to cope more effectively with stressors. Its enhancement in the work environment would thus appear to be beneficial.

Finally, the fact that generalised self-efficacy moderates the relationships between job autonomy and emotional exhaustion offers us valuable information for redesigning jobs. High levels of job autonomy are not associated in a direct way with improved psychological well-being, the latter depending rather on levels of self-efficacy. Thus, for workers with low self-efficacy, greater autonomy (which is generally related to increased responsibility and professional challenge) is associated with greater emotional exhaustion. These results have clear implications for the redesign of jobs and for fitting the job to the person, as these require taking into account individual characteristics such as self-efficacy.

The results obtained in relation to the moderation of burnout are important for the design of strategies oriented towards its prevention through job redesign. The results suggest that one way to prevent burnout could be to reduce demands in order to prevent cynicism, and to increase resources to prevent emotional exhaustion.

In sum, the promotion of high levels of self-efficacy in work contexts can help workers to cope better with the negative effects of stressors. This is a real challenge for organisations and the individuals that work in them.

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