

Psychosocial sources of stress and burnout in the construction sector: A structural equation model

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This study develops and tests a structural equation model of social stress factors in the construction industry. Leadership behaviours, role conflict and mobbing behaviours are considered exogenous sources of stress; the experience of tension and burnout are considered mediator variables; and psychological well-being, propensity to quit and perceived quality are the final dependent variables. A sample of Spanish construction workers participated voluntarily and anonymously in the study. After considering the indices of modification, leadership showed direct effects on the propensity to quit and perceived quality. The overall fit of the model is adequate ($\chi^2(13) = 10.69, p = .637, GFI = .975, AGFI = .93, RMR = .230, NFI = .969, TLI = 1.016, CFI = 1.000, RMSEA = .329$). Construction has been considered a sector characterized more by high physical risks than socially-related risks. In this context, these findings about the effects of social sources of stress in construction raise new questions about the organizational characteristics of the sector and their psychosocial risks.

Fuentes psicosociales de estrés y burnout en el sector de la construcción: un modelo de ecuaciones estructurales. Este estudio desarrolla y contrasta un modelo de ecuaciones estructurales sobre los factores sociales de estrés en el sector de la construcción. Las conductas de liderazgo, el conflicto de rol y las conductas de acoso se consideran fuentes exógenas de estrés; la experiencia de tensión y el burnout se consideran variables mediadoras; y el bienestar psicológico, la propensión al abandono y la calidad percibida son las variables dependientes finales. Una muestra de trabajadores de la construcción españoles participaron voluntaria y anónimamente en el estudio. Después de considerar los índices de modificación, el liderazgo también mostró efectos directos sobre la propensión al abandono y la calidad percibida. El ajuste global del modelo es adecuado ($\chi^2(13) = 10.69, p = .637; GFI = 0.975; AGFI = 0.93; RMR = .230; NFI = 0.969; TLI = 1.016; CFI = 1.000; RMSEA = .329$). La construcción ha sido considerada un sector caracterizado más por riesgos físicos que sociales. En este contexto estos resultados sobre los efectos de fuentes sociales de estrés en construcción plantean nuevas cuestiones sobre las características organizacionales del sector y sus riesgos psicosociales.

In the last few decades, the economy has been characterized by multiple macroeconomic and microeconomic transformations. Some of these main transformations are the globalisation of the economy and markets, the continuous modifications in production and information technologies, the growing development of the services sector, and the modifications in the workforce structure. These transformations have generated essential changes in the nature of the work, which is increasingly characterised by significant mental and emotional demands, rather than physical demands (e.g., Vahtera, Kivimäki, Pentti, & Theorell, 2000). Many sectors have become characterised by stressful psychosocial demands that are involved in individual health and organizational outcomes. This paper explores the importance of a set of well-known social sources of stress and burnout in the construction

industry, a sector traditionally characterised more by physical than social sources of risk.

Stress and burnout are concepts with a great tradition in the organisational and social literature (Crandall & Perrewé, 1995; Maslach, Schaufeli & Leiter, 2001). Some people-oriented professions have traditionally been considered psychosocially stressful professions; however, in the current work context, other professions belonging to sectors not directly oriented toward people-related work could also be considered psychosocially stressful professions. Statt (1994) carried out a comparative study of the inherent stressfulness of different professions, and they pointed out construction as the third most stressful profession after mining and police work. Current characteristics of the construction industry could be contributing to the psychosocial stress of its workers. Among these characteristics are multilevel subcontracting, time pressure, and the predominant temporal contracts that facilitate constant worker rotation and an unstable work. Construction settings are characterised by the simultaneous presence of many different types of dangerous physical risks and continuous changes in the work environment, which implies continuous changes in the relevant types of risk and their balance and interaction. These

characteristics could contribute to the emergence of more unstable leadership structures, non-adequate leadership behaviour, the existence of many sources of job demands, easily contradictories among them, and even dysfunctional social relationships, which can be considered important stressors of a social nature. These characteristics justify considering an interesting focus on the construction industry research about social stress sources and their possible effects, such as tension and burnout factors.

There are several theoretical models about stress factors and their effects on individual and organizational health (e.g., Sonnentag & Frese, 2003). The Demand-Control-Support Model (Karasek and Theorell, 1990) suggests that the interactive combinations of psychological job demands, decision-making capacity, and social support in the workplace explain the different consequences of stress. The most detrimental consequences for people's health and well-being arise from the combination of high job demands, low decision-making latitude and low social support. There is abundant empirical evidence, which, partially, can be understood as supporting it (Van der Doef and Maes, 1999). The Person-Environment fit theory (Harrison, 1978) is another of the traditional widely accepted approaches to conceptualising occupational stress. This model assumes that stress occurs as a result of an incongruity between the individual and the environment. Job conditions, such as role conflict or interpersonal conflict, are some examples of reported variables that can contribute to a person-environment fit problem and often have adverse effects on employee well being (Spielberg, & Reheiser, 1994).

The most recognized conceptualisation considers burnout as a three-dimensional syndrome characterized by emotional exhaustion, depersonalisation and reduced personal accomplishment (Maslach & Jackson, 1981). Originally, burnout was conceived as concerning individuals who do some kind of «people-work». However, Pines and Aronson (1988) do not restrict burnout to specific occupations, and they define burnout as a state of physical, emotional and mental exhaustion caused by long-term involvement in situations that are emotionally demanding. This is a current trend that has extended the concept of burnout far from occupations related to services, health or education sectors (Maslach, et al. 2001).

In this study, stress is considered as an experience primarily focused on the concept of strain perception (i.e., as one's perception of being stressed or feeling stress and not as a physiological outcome response) (Marshall & Barnett, 1993) and burnout is considered as a process resulting from a build-up of chronic stress from emotionally demanding situations, that is, a prolonged response to chronic job stressors (Maslach, et al. 2001; Pines, Aronson and Kafry, 1981). Both, stress and burnout are closely related variables. In fact, Gil-Monte and Peiró (1997) consider burnout as a response to occupational stress when coping strategies fail, and as a mediator variable between the perceived stress and its individual and organizational consequences. Merino, Carbonero, Moreno and Morante (2006) also found empirical evidence about a positive and significative correlation between the experience of irritation and burnout.

There are many potential stressors in the current work contexts that can lead to stress and burnout. Ivancevich and Matteson (1985) and Peiró (1993) have developed taxonomies that attempt to categorize the more probable stressors in organizations. The stressors can be categorised into physical stressors (e.g., illumination, noise, hygienic conditions...), individual stressors

(e.g., role conflict), group stressors (e.g., mobbing), organisational stressors (e.g., structure, technology) and extra-organisational stressors (e.g., family stressors). The taxonomy developed by Cartwright and Cooper (1997) categorizes workplace stressors into: a) *factors intrinsic to the job itself* (e.g., temperature, new technology, risks and hazards), b) factors related to *organizational roles* (e.g., role conflict), c) factors related to *work relationships* (e.g., mobbing, autocratic or abusive relationships with supervisors), d) factors related to *career development* (e.g., job insecurity), e) *organisational factors* (e.g., autocratic or laissez-faire leadership) and f) factors related to *the work-home interface* (e.g., lack of time). Although the taxonomies are not exempted from limitations, they facilitate the analysis of some work stressors and make it possible to characterize different sectors by different configurations of prevalent kinds of sources of stress.

A certain number of recurring social and organisational factors can be important antecedents of stress and burnout. Some that have been considered are the leadership exercised by managers (Ivancevich and Matteson, 1985; Cartwright and Cooper, 1997; Peiró, 1993), incompatible role expectations or demands (Cartwright & Cooper, 1997; Ivancevich & Matteson, 1985; Katz, & Kahn, 1978; Quick & Quick, 1984; Salanova, Grau, & Martínez, 2005) or the quality of the interpersonal relationships (Cartwright & Cooper, 1997; Quick & Quick, 1984; Ivancevich & Matteson, 1985; Maslach, 1999). Empirical evidence from studies of qualitative job demands demonstrates a moderate to high correlation between role conflict and burnout (Maslach, et al. 2001). Mobbing behaviours have been considered some of the main sources of social stress (e.g. Moreno, Rodríguez, Garrosa, & Morante, 2005; Topa, Morales, & Gallastegui, 2006; Zapf, Einarsen, Hoel, & Vartia, 2003; Zapf, Knorz and Kulla, 1996). Lack of emotional support, distrustful or destructive relationships between co-workers, appear as factors that can produce high levels of tension (e.g., Beehr, 1981; Einarsen & Mikkelsen, 2003). Therefore, leadership, role conflict and mobbing behaviours are three representative social sources of stress.

The negative consequences of the experience of stress and burnout for individual health and well-being, as well as for the health and results of the organization, are also well recognized (Maslach, 1999; Karasek & Theorell, 1990; Quick, Murphy, & Hurrell, 1992; Schulz, Greenly & Brown, 1995). The consequences of stress and burnout on the health of the employees include significant physiological and psychological outcomes. Physiological consequences include symptoms that are risk factors for cardiovascular (e.g., Moya-Albiol, Serrano, González-Bono, Rodríguez-Alarcón, & Salvador, 2005; Vrijkotte, van Doormen, & de Geus, 1999) and musculoskeletal diseases (e.g., Bongers, de Winter, Kompier, & Hildebrandt, 1993). A decreased efficacy of the immune system has been also reported (e.g., Hebert, & Sheldon, 1993). Moreover, individuals in high-strain jobs showed the lowest psychological well-being scores (e.g., Van der Doef and Maes, 1999). Some of the most important psychological symptoms are depressive symptoms and psychosomatic complaints (e.g., Schonfeld, 1992).

The organizational consequences of work stress and burnout can be similar. Organizational results have been studied as a construct related to responses to stress. Specifically, a decrease in the quantity and quality of the performance at work (e.g., Sargent, & Terry, 1998) or a reduction in performance accuracy (e.g., Searle, Bright and Bochner, 1999) frequently appear as important organizational consequences of stressful situations. Following this

literature, the perceived quality can be considered an indicator of organizational results. In addition, there is consistent evidence that work stressors are positively related to intentions to quit the organization and to job search behaviour (e.g., Cavanaugh, Boswell, Roehling and Boudreau, 2000) or absenteism (Boada, Vallejo, Agulló, & Mañas, 2005). Koeske and Koeske (1989) also found strong evidence that the emotional exhaustion dimension of burnout mediates the relationship between job stress and workers' intentions to quit.

The construction sector has been characterized by high accident rates (e.g., Lundholm, 2004) and a prevalence of physical risks in continuously changing work-settings (e.g., Welch, Hunting, & Murawski, 2005). The clear importance of physical risks and the urgency of dealing with the high accident rates have increased the importance of research about safety climate (e.g., Haslam, et al. 2005; Meliá, Lima, Mearns, & Silva, 2006). However, the current characteristics of the construction sector make necessary to take into account the social sources of stress and their consequences that can also play an important role in occupational health in construction and affect safety issues (Siu, Phillips, & Leung, T. 2004). Therefore, in this sector, it would be valuable to get a better understanding of the social sources of stress and burnout and their individual and organizational consequences. Specifically, in this study, the dysfunctional style of leadership and support provided by managers to the workers, the existence of contradictory instructions or incompatible demands in the development of the work tasks and the experiences of social rejection or mobbing behaviours at work are the hypothesized organizational and psychosocial factors having an influence on worker experiences like tension and burnout, and their individual and organizational consequences, such as psychological well-being, propensity to leave their current organization and the quality of the work that they are developing.

The objective of this study is to develop and test, in the construction sector, a structural equations model, taking into

account leadership, role conflict and mobbing behaviours as social stressors that influence the experience of tension and burnout and, in turn, psychological well-being, propensity to leave and the perceived quality of work.

Figure 1 shows the hypothesized model. The *antecedent variables* included are leadership, role conflict and mobbing behaviour. Experience of tension and burnout are the *intervening variables* that are hypothesized as affecting the *outcome variables* of perceived quality, psychological health and propensity to leave.

Method

Participants

The sample is made up of construction workers from the area of Valencia (N=105). The majority of the participants were male (81.9 %), the 53.3 % ranging between 20 and 29 years of age, the 22.9 % between 30 and 39 years and the 12.4% between 40 and 49 years. The main educational levels were primary studies (34.3%), secondary studies (23.8 %) and professional technicians (15.2%). 72.1 % were employees and the rest were supervisors. 29.5% of the participants were workers developing specific construction jobs such as electricians, plumbers, painters and carpenters, 22.1% were bricklayers and 20.5 % were high level technicians mainly architects and engineers.

The majority of workers belong to the main company of the worksite (79.4%) whereas 19.6 % belong to a subcontracted company working at the worksite. The most common lengths of contracts are the tenured contract (52.9%) and contracts lasting less than one year (47.1%).

Measures

The Battery of Psychosocial Factors of the University of Valencia (Meliá, 2004) was administered to construction workers

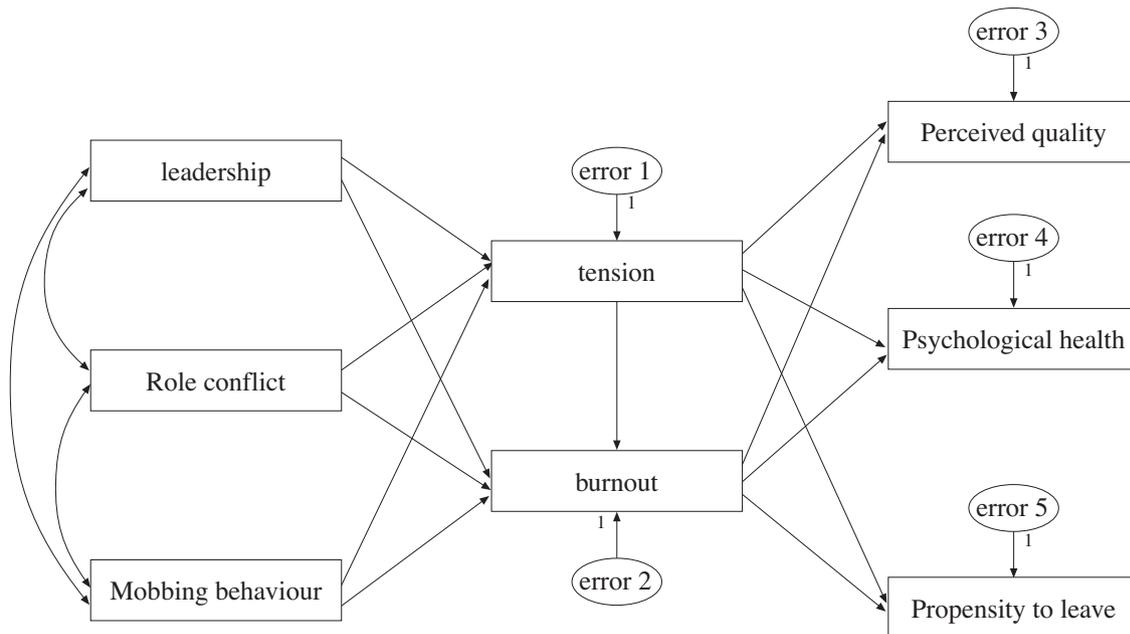


Figure 1. Hypothesized model

who filled it out individually and anonymously. This instrument is a validated set of questionnaires that measures the aforementioned variables within a broad measurement framework. Below the alpha coefficients calculated in a multisectorial sample (Melià, 2004) are reported. Each variable was measured using items answered on a five point Likert scale.

Antecedent variables. The *Leadership* scale is comprised of 6 items (e.g., I receive support and help from my bosses whenever I need it) with a 0.83 coefficient alpha. The scale assesses the perceptions of the received leadership behaviours. *Role Conflict* is measured by an 18-item scale (e.g., I receive contradictory instructions from two superiors) with a 0.91 coefficient alpha. This scale assesses the extent that the work expectations and demands presented to a worker are contradictory or incompatible. The *Mobbing* scale is comprised of 6 items (e.g., I feel rejected or left out at work), with a 0.86 coefficient alpha. The scale assesses the extent that workers are being victims of social forms of bullying behaviours.

Intervening Variables. The *Tension* scale consisted of 17 items (e.g., I feel anxious during my workday) that assess the extent that workers perceive mental strain and anxiety on their job. The coefficient alpha for this scale is 0.93. The *Burnout* scale consisted of 5 items assessing different symptoms of the burnout experience (e.g., I have lost interest in my work). The coefficient alpha for this scale is 0.81.

Outcome Variables. Three potential consequences of tension related to work and burnout were included. *Perceived Quality* was comprised of 7 items measuring the workers' perceptions of the quality of the work and the results of the organization (e.g., We work with equipment and methods that guarantee the high quality of the product or service). The coefficient alpha for this scale is 0.83. *Psychological health* was measured with 12 items coming from the General Health Questionnaire (Goldberg & Hillier, 1979). The items deal with the workers' perceptions of their psychological health (e.g., in the last few weeks, I have felt

capable of making decisions about things). The coefficient alpha for this scale was 0.85. *Propensity to leave* was measured by an 8-item scale (e.g., I pay attention to the opportunities that can arise to find a better job) with a coefficient alpha of 0.82. The scale reflected the extent to which workers have intentions to leave their current jobs and change to another organization.

Statistical Analysis

The maximum likelihood method of the AMOS 6.0 Structural Equation Modelling (SEM) program was used (Arbuckle, 2005). The analysis involved estimating paths between the variables, eliminating those not having statistically significant path coefficients, and rerunning the estimates to derive a model fitting the data.

The overall fit was assessed using the following indices of fit: chi-square, goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), root mean square residual (RMR), normed fit index (NFI), the Tucker-Lewis coefficient (TLI), comparative fit index (CFI) and root mean square error of approximation (RMSEA).

Results

Figure 2 shows the standardized path coefficients. The Chi-square for the hypothesized model showed that it is not a good representation of the empirical data (Chi-square= 37.353, d.f.= 12, p<.001). The model was also assessed using other goodness-of-fit indices: GFI= .917; AGFI= .750; RMR= .044; NFI= .891; TLI= .812; CFI= .919; RMSEA= .143. GFI is always less than or equal to 1. A GFI= 1 indicates a perfect fit (Jöreskog and Sörbom, 1984). AGFI is bounded above by 1, which indicates a perfect fit. It is not, however, bounded below by 0, as the GFI is. The smaller the RMR is, the better. An RMR of 0 indicates a perfect fit. Values of NFI equal or greater than 0.9 indicate a good fit. TLI values close to 1 indicate a very good fit (Bentler and Bonett, 1980). CFI values close to 1 indicate a good fit (Bentler, 1990). Values of RMSEA

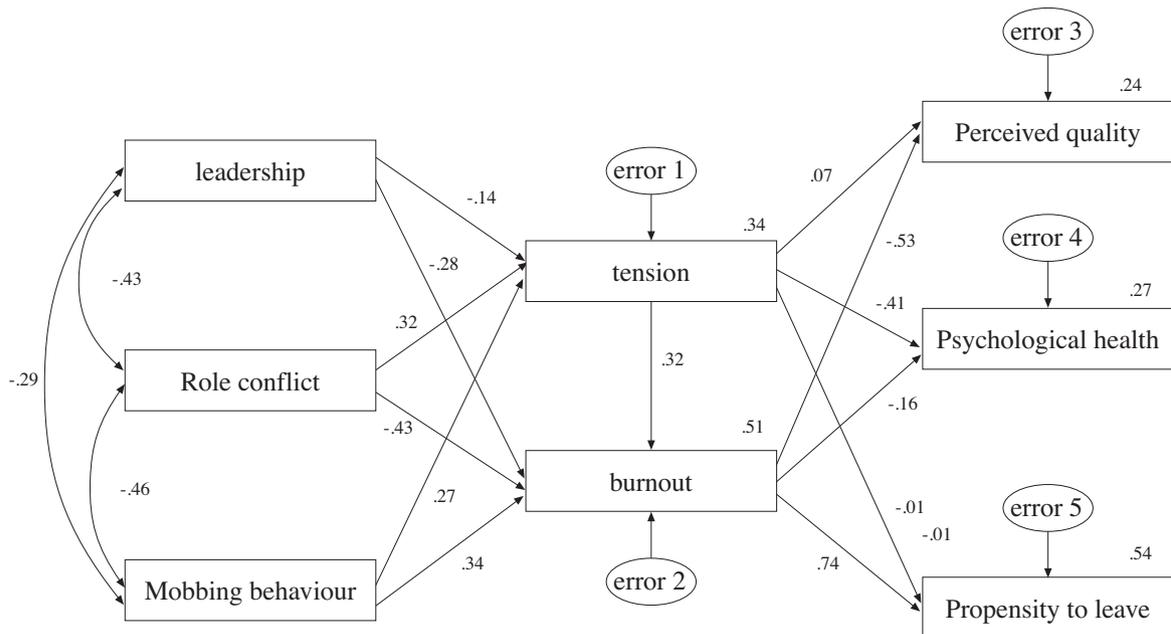


Figure 2. Results of the hypothesized model

equal or lesser than 0.10 indicate a good fit (Browne and Cudeck, 1993; Steiger, 1990).

Table 1 shows the unstandardized path estimates and the critical ratios for the model. Table 2 displays the indices of modification suggested to improve the fit of the model.

The results of the critical ratios and the indexes of modification were followed to improve the model fit. The results of the revised model are presented in Figure 3.

The revised model is a good representation of the empirical data. Although the model has gained a degree of freedom (d.f=

Table 1
Unstandardized path estimates and critical ratios

		Estimate	S.E.	C.R.	P
Tension	← Role conflict	.270	.081	3.345	.001*
Tension	← Leadership	-.133	.084	-1.576	.115
Tension	← Mobbing behaviour	.284	.093	3.046	.002
Burnout	← Leadership	-.316	.087	-3.643	.001*
Burnout	← Mobbing behaviour	.413	.099	4.167	.001*
Burnout	← Role conflict	-.012	.086	-.136	.892
Burnout	← Tension	.380	.100	3.808	.001*
Propensity to leave	← Burnout	.687	.075	9.111	.001*
Perceived quality	← Burnout	-.585	.115	-5.079	.001*
Psychological health	← Burnout	-.121	.079	-1.527	.127
Propensity to leave	← Tension	-.012	.089	-.132	.895
Perceived quality	← Tension	.086	.136	.633	.527
Psychological health	← Tension	-.379	.093	-4.060	.001*

* p<0.001

Table 2
Indices of modification

		M.I.	Par Change
Perceived quality	← Leadership	10.749	.347
Propensity to leave	← Leadership	9.069	-.209

13), the chi-square is not significant (Chi-square= 10.690, p=.637), and the overall fit of the model is also acceptable when assessed using other indices: GFI= 0.975; AGFI= 0.93; RMR= .230; NFI= 0.969; TLI= 1.016; CFI= 1.000; RMSEA= .329.

The critical ratios and the unstandardized path estimates between latent variables are presented in Table 3. Nine of the twelve paths within the model are significant at a 0.001 level; one

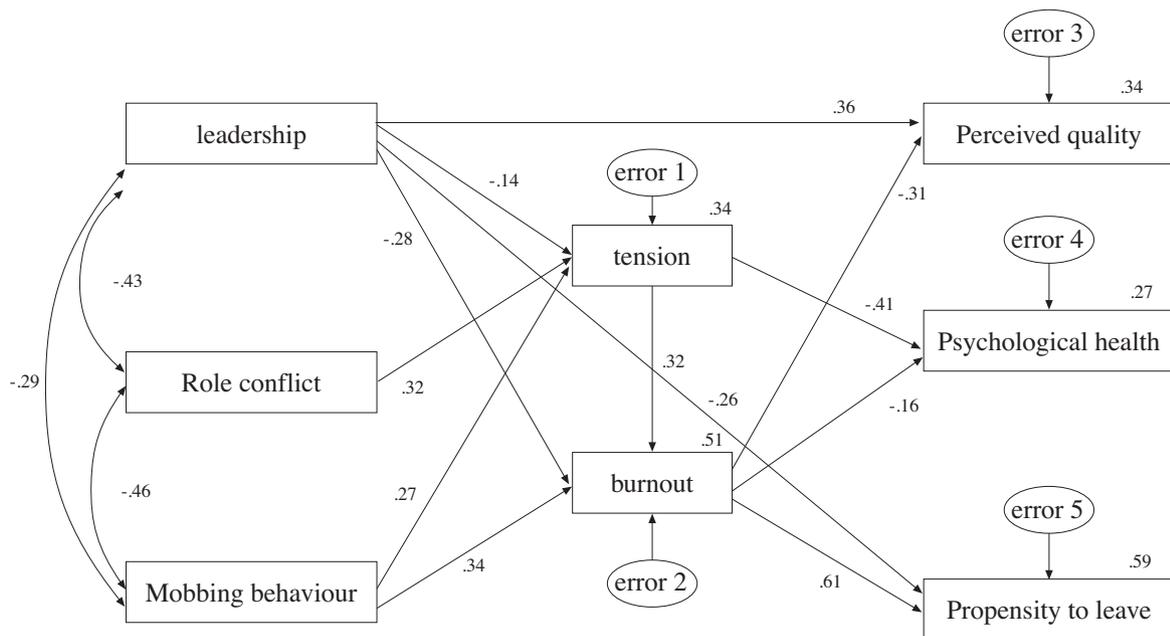


Figure 3. Results of the revised model (standardized path coefficients)

path is significant at a 0.002 level, and only two paths (the relationship between leadership and tension and the relationship between burnout and psychological health) are not significant, although they show the signs in the expected direction.

The structural model shows leadership, role conflict and mobbing as influencing all outcome variables through direct or indirect pathways. Specifically, the experience of work-related tension is directly affected by leadership, role conflict and mobbing behaviours. Leadership, mobbing behaviours and tension directly affect burnout. Perceived quality is affected by leadership and burnout, psychological health is affected by tension and burnout, and propensity to leave is affected by leadership and burnout. All the signs were in agreement with the hypotheses.

Tabla 4 shows the Pearson's Correlations between the study variables. All variables are related in the expected direction.

Discussion

The stressful potential of social variables, such as the leadership provided to the workers, the role conflict and mobbing behaviours, has been confirmed in a sample of construction workers. Likewise, the results supported tension and burnout

symptoms as central psychosocial experiences associated with undesirable individual and organizational outcomes, such as propensity to leave, psychological health and the perceived quality of the work and results of the organization.

The importance of leadership behaviours appears corroborated by their paths affecting both the intervening variables and the organizational outcome variables. Thus, the specific ways managers or superiors treat the workers or take them into account, provide them with support, or are able to resolve problems and develop their jobs appear to be an important and direct social source related to the levels of tension and burnout symptoms. This finding is consistent with the taxonomies that recognize leadership as a potential source of stress (e.g., Cartwright and Cooper, 1997) and the empirical evidence showing that a lack of social support by superiors or supervisors is linked to burnout (e.g., Maslach, et al. 2001). Likewise, leadership shows a direct influence on both the perceived quality of work and results provided by the organization and the propensity to change to another company or pay attention to the opportunities that can arise to find a better job.

The potential stressfulness of role conflict appears partially corroborated. Its direct effect on tension is confirmed (Katz, & Kahn, 1978), but the positive relationship commonly reported

Table 3
Critical ratios and unstandardized path estimates

		Estimate	S.E.	C.R.	P
Tension	← Role conflict	.270	.081	3.345	.001*
Tension	← Mobbing behaviour	.284	.093	3.046	.002
Tension	← Leadership	-.133	.084	-1.576	.115
Burnout	← Tension	.375	.095	3.963	.001*
Burnout	← Mobbing behaviour	.409	.096	4.279	.001*
Burnout	← Leadership	-.313	.083	-3.751	.001*
Perceived quality	← Burnout	-.348	.101	-3.438	.001*
Psychological health	← Burnout	-.121	.079	-1.527	.127
Propensity to leave	← Burnout	.562	.067	8.421	.001*
Psychological health	← Tension	-.379	.093	-4.060	.001*
Perceived quality	← Leadership	.448	.113	3.952	.001*
Propensity to leave	← Leadership	-.273	.075	-3.652	.001*

* p<0.001

Table 4
Correlations

	Leadership	Role Conflict	Mobbing	Tension	Burnout	Perceived Quality	Psychological Health
Role Conflict	-.425**						
Mobbing	-.288**	.455**					
Tension	-.355**	.504**	.461**				
Burnout	-.489**	.425**	.563**	.572**			
Perceived Quality	.515**	-.155	-.146	-.236*	-.491**		
Psychological Health	.291**	-.311**	-.202*	-.504**	-.393**	.265**	
Propensity to Leave	-.559**	.333**	.373**	.413**	.734**	-.454**	-.288**

** Significant correlation p<0.01
* Significant correlation p<0.05

between role conflict and burnout (Maslach, et al. 2001) is not found in this study. Mobbing behaviours also are corroborated as a stressful factor (Zapf, Knorz and Kulla, 1996) having effects on both tension and burnout. Role conflict and mobbing behaviours do not show direct relationships with individual and organizational outcomes. Incompatible work expectations or demands made to workers and the rising social forms of mobbing behaviours only affect the perceived quality, psychological health and propensity to leave variables through their effects on the tension and burnout.

The direct path going from tension to burnout recognizes the nature of burnout as a chronic stressor, in which one of its main causes is a long term accumulation of tension (Pines and Aronson, 1988). The negative relationship between tension and psychological health (e.g., Van der Doef and Maes, 1999) is supported by the negative significant path going from tension to psychological health. It is the only direct relationship tension showed with outcome variables. The relevant stressful potential of burnout is supported by its negative consequences reported on all the individual and organizational outcomes. Thus, not only does the psychological health and well-being of the workers suffer, but the organizational health is also affected with undesirable consequences, such as a diminished quality of the work (Searle, et al. 1999) and an increased propensity of workers to leave (Cavanaugh, et al., 2000).

These findings can be considered significant because they have been obtained in the construction sector, which is not a traditional sector for the study of social sources of stress and burnout. Construction jobs do not seem to be characterized by the existence of the person-oriented tasks linked to some of the social sources of stress and burnout. However, these results suggest that the social relationships leading to psychosocial and organizational factors should also be taken into account in the construction sector as sources of stress and burnout. These findings about the correlates of tension and burnout experiences in construction workers emphasize the importance of some social-oriented sources of stress (i.e., leadership, role conflict and mobbing behaviours) and suggest the interest of considering these social stress factors in the assessment of psychosocial risks.

Limitations

The main limitation of this study arises from the exploratory nature of the method to test the hypothesized model. The cross-

sectional design and the small size of the available sample are other limitations. Due to the cross-sectional design, causality explanations are not allowed, and some alternative directions of the relationships cannot be discarded. These limitations suggest the need for a cross-validation in new construction samples. However, the fit of the revised model and the results regarding the paths and their directionality are of theoretical importance in the construction sector and could orient future longitudinal research to get causal conclusions.

Conclusions

The model supports the key importance of tension and burnout as significant psychosocial risk factors in construction. In addition, this model increases the knowledge about the relationships among the stress and strain variables in the construction sector, considering together classical stress factors, such as the style of leadership and role conflict, and other emergent social stressors like mobbing behaviours. Construction has traditionally been considered a sector where social relationships and work involvement do not characterize most jobs. In this context, the finding about the effects of the mobbing behaviours and burnout experience opens new questions about the importance of burnout in non-socially orientated jobs. Identifying leadership, role conflict and mobbing behaviours as social sources of tension, burnout and other undesirable individual and organizational results, this model can be useful for guiding psychosocial assessments in the construction industry. Likewise, the model could orient future research in a sector where new knowledge about psychosocial health promotion and stress management focusing on the social area also seems necessary.

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