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INTERPERSONAL CONFLICT AND PERCEIVED WORK STRESS: THE ROLE OF NEGATIVE AFFECTIVITY

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This study examined the role of negative affectivity (NA) in the formation process of perceived work stress among workers employed in two Italian organizations. Psycho-physical strain, perceived conflict (with superiors and colleagues), and NA were detected through self-report, adapting the Strain-Free Negative Affectivity Scale to the Italian context. Four alternative models, popular in the literature on work stress, were tested. Each hypothesizes a specific role for NA. The analyses conducted suggest that NA has both a direct effect on strain and an indirect one, through perceived conflict. From a theoretical point of view, the results show, therefore, a substantive role of NA in the formation of perceived work stress. From an application point of view, they point to the opportuneness of also adopting hetero-evaluations or objective indicators of stress together with self-evaluations of stress.

Key words: Work stress; Negative affectivity; Interpersonal conflict; Self-evaluations; Psycho-physical strain.

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INTRODUCTION

The assessment of work stress is very often conducted by using self-report measures to detect both risk factors and consequences in terms of strain. This is not surprising, given the costs associated with the use of "alternative" measures, such as: a) hetero-evaluations of the work environment (provided by direct supervisors or colleagues; Grebner, Semmer, & Elfering, 2005); b) assessment of the psycho-physical symptoms related to work stress by physicians (Honkonen et al., 2006); c) assessment of objective indicators of disease in terms of short- and long-term sickness absences or actual turnover (Ahola et al., 2008). Besides the advantages related to costs, self-reports also provide direct access to the workers' subjective appraisal of their working environment — both physical and social. Many researchers agree that it is the perceptions of the work environment, rather than the workplace itself, that leads to disease situations and work stress (Lazarus, 1999).

However, some authors have criticized the exclusive use of self-report measurements in the assessment of work stress. In particular, many objections are related to the role, as yet unclear, played by affectivity in the process of work stress (Cox, Griffiths, & Rial-González, 2000; Semmer, Grebner, & Elfering, 2004).

Affect is definable as a way of feeling from a phenomenological point of view (Kaplan, Bradley, Luchman, & Haynes, 2009; Watson, Wiese, Vaidya, & Tellegen, 1999).

The literature emphasizes the distinction between trait, or dispositional, affect versus state, or situational, affect. State affect refers to what a person experiences at any one time, while trait affect (or affectivity) indicates the disposition of an individual to experience certain emotional states over time (Thoresen, Kaplan, Barsky, Warren, & de Chermont, 2003).

State affect can take the form of emotions, intended as affective states referring to specific objects or circumstances and characterized by an intensity that is sufficient to interrupt ongoing thoughts, or moods, defined as the most common emotional states, not related to a specific object or situation and characterized by an intensity that does not interrupt ongoing thoughts.

Moreover, while moods can only be described along a positive-negative dimension, it is possible to distinguish different types of emotions, such as self-focused (e.g., guilt) or non-self-focused (e.g., anger; Watson et al., 1999). Moods and emotions also have a beginning and an end, and a limited duration ranging between a few minutes and several hours (Weiss & Kurek, 2003). This distinguishes them from dispositional affect, conceived as a stable personality dimension.

According to Watson and Clark (1984), dispositional affect is divided along two orthogonal unipolar dimensions, namely Negative Affectivity (NA) and Positive Affectivity (PA). Low levels of NA do not necessarily correspond to high levels of PA, and vice versa.

Watson and Clark (1984) defined negative affectivity (NA) as an individual dimension of mood disposition that reflects pervasive differences in the conception of the self and the tendency to experience negative emotional states. Associated with high levels of NA are negative feelings such as guilt, fear, anxiety, and nervousness, while low levels of NA are associated with feelings such as serenity and calmness (Kaplan, Warren, Barsky, & Thoresen, 2009; Watson, Clark, & Tellegen, 1988). In addition, high-NA individuals tend to have a negative view of themselves, their surroundings and the world in general, which they perceive as hostile and threatening. They also tend to experience higher levels of distress and to be more dissatisfied with themselves (Thoresen et al., 2003; Watson et al., 1999).

PA reflects the degree to which a person feels enthusiastic, active, alert, and energetic (Watson et al., 1988). High levels of PA are therefore associated to actively seeking the company of others, a positive engagement with the environment, a positive view of oneself and of the world in general. In contrast, low levels of PA are associated with feelings of lethargy and sluggishness (Thoresen et al., 2003).

Watson et al. (1988) also argued that NA, but not PA, is connected to non-optimal coping strategies, psychological strain, health problems, and frequent occurrence of unpleasant events. Vice versa, PA, but not NA, is related to social activities, satisfaction, and frequent occurrence of positive events.

According to the authors, this is due to the fact that NA and PA are subjective, emotional components of two biobehavioral basic systems that have evolved over time to promote the survival of the individual (Watson et al., 1999).

Consistent with this view, NA is a manifestation of the withdrawal-oriented Behavioral Inhibition System (BIS; Gray, 1987), whose purpose is to inhibit behaviors that can lead to negative consequences in the presence of potentially threatening stimuli.

The BIS has an anticipatory value: it promotes greater attention in the analysis of environmental cues and motivates the body through feelings/emotions like nervousness, fear, or worry, to move with caution and to avoid situations of potential danger ("stop, look, and listen systems"; Watson et al., 1999).

On the other hand, PA is a manifestation of the Behavioral Activation System (BAS; Fowles, 1987), whose purpose is to promote, through feelings/emotions such as energy and force, "reward-seeking" behaviors which can lead to rewards in the presence of potentially positive stimuli ("go system").

High-NA individuals are therefore more reactive to negative stimuli and more characterized by negative emotions and avoidance behaviors. High-PA individuals are, conversely, more responsive to positive stimuli and characterized by more positive emotions and approach-related behaviors.

Some studies have confirmed this theoretical approach. Compared to PA, NA appears to be associated more to self-report measures of work stressors, psychological and physical strain, job burnout (depersonalization and emotional exhaustion), counterproductive work behaviors, and turnover intentions (Connolly & Viswesvaran, 2000; Kaplan, Bradley, et al., 2009; Kaplan, Warren, et al., 2009; Thoresen et al., 2003).

In a recent study, Zellars, Meurs, Perrewé, Kacmar, and Rossi (2009) also noted an association between negative affectivity and physiological arousal, measured objectively in terms of muscle tension (detected by electromyography) and skin temperature.

In parallel, PA appears to be more strongly associated than NA to measures of job satisfaction, organizational commitment, organizational citizenship behaviors, and personal accomplishment (Connolly & Viswesvaran, 2000; Fogarty et al., 1999; Kaplan, Bradley, et al., 2009; Thoresen et al., 2003; Van Diest et al., 2005; Watson & Pennebaker, 1989).

This could be related to a greater reactivity to negative stimuli for high-NA individuals (vs. positive for high-PA individuals), to a greater propensity to respond in terms of negative emotions for the high-NA individuals (vs. positive for high-PA ones), and to a greater propensity to practice avoidance behaviors for high-NA individuals (vs. "seeking reward" for high-PA individuals).

In light of the theoretical framework described above, it is not surprising that the relationship between negative affectivity and work-related stress has been the subject of multiple investigations. In particular, some authors consider NA as a nuisance variable in the evaluation of work stress, which contributes to increasing (spuriously inflating) the correlations between self-report measures of stressors and strain (Brief, Burke, George, Robinson, & Webster, 1988; Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

High-NA individuals perceive their working environment in a more negative way while, at the same time, showing higher levels of strain. The observed correlation between stressors and strain is thus explained in the light of a third variable that determines both: NA.

Burke, Brief, and George (1993) took into consideration the zero-order correlations between stressors (autonomy, workload, organizational constraints, job ambiguity, and conflict) and strain (frustration, job satisfaction, and health complaints). The partial correlations, controlling

the effect of NA, were found to be definitely lower. According to this perspective, it is therefore useful to detect NA, to evaluate its correlation with self-report measures of stressors and strain and to statistically control its effect (Cavanaugh, Boswell, Roehling, & Boudreau, 2000; Wiesner, Windle, & Freeman, 2005).

In the literature, some research partially replicated the results mentioned above (Lazuras, Rodafinos, Matsiggos, & Stamatoulakis, 2009; Moyle, 1995). Other studies obtained different results depending on the outcome considered, for example when negative affectivity acts as a nuisance variable in relation to outcomes of an affective nature (vs. cognitive in nature; Barsky, Thoresen, Warren, & Kaplan, 2004) or of a negative nature (vs. positive; Abraham, 1999). Other studies, however, did not replicate the results of Burke et al. (Spector, Chen, & O'Connell, 2000).

This approach also met with some criticism, both in theory and methodology.

According to Spector, Zapf, Chen, and Frese (2000), NA can help explain the relationship between stressors and strain without being considered a bias, influencing strain directly or indirectly, through the perception of the work environment.

Moreover, as noted by Williams, Gavin, and Williams (1996), this technique assumes that the shared variance between predictor, dependent variable, and NA is completely attributable to NA rather than to an additional fourth variable, not considered in the research. If this assumption were violated, a portion of variance shared — that in fact may also depend on other variables — would eventually be exclusively attributed to NA.

As stated by other authors, NA has a substantive, rather than disturbing, role, in the relationship between stressors and strain. According to Watson and Clark (1984), high-NA individuals experience greater levels of distress and dissatisfaction in any situation, even in the absence of stressors. Some research supports the hypothesis of a direct effect of NA on psychological and physical strain (Lazuras et al., 2009; Mak & Mueller, 2001; Moyle, 1995; Parkes, 1990). In a recent meta-analysis, Thoresen et al. (2003) noted that NA is a significant predictor of both positive and negative job attitudes, such as job satisfaction, organizational commitment, emotional exhaustion, depersonalization, personal accomplishment, and turnover intention. The percentage of explained variance ranged between .03 (turnover intention) and .29 (emotional exhaustion). As per the authors, this difference may be attributable to the degree to which different constructs underlie the cognitive or the affective dimension.

According to a further theoretical perspective, high-NA individuals evaluate in a more negative way their working environment and, consequently, are more stressed than their low-NA colleagues. In other words, perceived stressors mediate the relationship between NA and strain. Mediation involves a causal hypothesis in which an independent variable determines a mediator which, in turn, determines a dependent variable (MacKinnon, Fritz, Williams, & Lockwood, 2007; Sobel, 1990).

Some research supported the hypothesis of an indirect effect of NA through perceived stressors on outcomes such as psycho-physical strain, job satisfaction, organizational citizenship behaviors, counterproductive work behaviors, and turnover intentions (Barsky et al., 2004; Fogarty et al., 1999; Grant & Langan-Fox, 2007; Judge, Erez, & Thoresen, 2000; Kaplan, Warren, et al., 2009; Lazuras et al., 2009; Moyle, 1995; Oliver, Mansell, & Jose, 2010). As maintained by Spector, Zapf, et al. (2000) the indirect relationship between NA and strain is particularly likely in relation to psycho-social stressors, and thus more dependent on the individual's intangible perceptions, with respect to stressors observed in some of the most studied theoretical models (Kara-

sek, 1979; Osipow, 1998). However, few studies have considered interpersonal conflict as a possible mediator of the relationship between NA and strain (Lazuras et al., 2009). Among these, at least in the authors' knowledge, no distinction was made between two dimensions of interpersonal conflict – namely conflict with superiors and with colleagues – which may have different effects in terms of strain (Bruk-Lee & Spector, 2006).

Finally, a still open issue involves the measurement of NA. In a meta-analysis of more than 200 studies, Thoresen et al. (2003) noted how NA was detected using different measurement scales, such as the Positive and Negative Affect Schedule (Watson et al., 1988), the Negative Affectivity Scale (Stokes & Levin, 1990), the scale of Negative Emotionality from the Multidimensional Personality Questionnaire (Tellegen, 1985), the Trait Anxiety Scale taken from the State-Trait Anxiety Inventory (Spielberger, Gorsuch, & Lushene, 1970) and, finally, the Scales of Neuroticism borrowed from Eysenck Personality Questionnaire (Eysenck & Eysenck, 1975) and the NEO-FFI Neuroticism Scales (Costa & McCrae, 1992). All this leads to a conceptual overlap between NA and the constructs related to it but still distinct, such as neuroticism and trait anxiety (Kaplan, Warren et al., 2009; Watson et al., 1999). According to Fortunato and Stone-Romero (1999) there is also an empirical overlap between measures of NA and measures of psychophysical strain (General Health Questionnaire, GHQ; Goldberg, 1978; MBI, Maslach Burnout Inventory; Maslach, Schaufeli, & Leiter, 2001), because both constructs are measured by items that refer to concepts such as distress, depression, and lack of confidence. These authors developed the Strain-Free Negative Affectivity Scale (SFNA), composed of items assessing the style of the subject's emotional reaction against adverse environmental conditions, as well as associated with work and life in general. The SFNA, designed to avoid conceptual and empirical overlap between measures of NA and strain, was used in some studies as a measure of trait negative affectivity (Fortunato & Williams, 2002; Crossley & Stanton, 2005; van Hooft & Crossley, 2008).

OBJECTIVES

The first objective of this study was to evaluate the metric properties of an Italian adaptation of the Strain-Free Negative Affectivity Scale (Fortunato & Stone-Romero, 1999).

A further objective was to test some alternative models that explain the relationship between NA, interpersonal conflict, and strain.

In the first model, initially proposed by Moyle (1995) and labeled common-cause model by Barsky et al. (2004), NA accounts for the relationship between stressors and strain. NA in this model has a confounding effect in the assessment of work stress (Burke et al., 1993). According to this model, therefore:

H1 = Negative affectivity positively predicts both interpersonal conflict and strain, while there is no association between interpersonal conflict and strain controlling the effect of NA.

In the second model (regression model; see Barsky et al., 2004) NA and interpersonal conflict positively and independently predict strain. This model is consistent with the empirical evidence of a direct effect of NA on strain. However, there is no association between NA and interpersonal conflict.

H2 = NA and interpersonal conflict positively predict strain, while there is no association between NA and interpersonal conflict.

In the third model (full mediation model; Moyle, 1995) interpersonal conflict mediates completely the relationship between NA and strain. This model is consistent with the empirical evidence of an indirect effect of NA on strain, nevertheless it is assumed that NA does not exert a direct effect on strain.

H3 = Negative affectivity exerts an indirect effect on strain through interpersonal conflict.

In the fourth model (partial mediation model; Fogarty et al., 1999; Kaplan, Bradley, et al., 2009) interpersonal conflict partially mediates the relationship between NA and strain. The latter model is consistent with the empirical evidence of an indirect effect of NA on strain, but it is believed that NA also exerts a direct effect on it.

H4 = Negative affectivity exerts both a direct and an indirect effect on strain through interpersonal conflict.

METHOD

Participants

The survey covered all employees of two organizations. The first (A) is a private organization in the services industry. The population involved in the study consisted of 371 workers with an average age of 42.34 years (*SD* = 5.94), 67% of them being female. The second (B) is a public organization composed of 749 employees with an average age of 51.49 years (*SD* = 4.49), 53% of which female.

Materials

All members of both organizations (Organization A, *n* = 371; Organization B, *n* = 749) were administered some scales of the test of work-related stress risk assessment in the perspective of organizational well-being, Q_u-Bo (De Carlo, Falco, & Capozza, 2008), an instrument validated for the Italian context, consisting of the scales showed below, as well as the Strain-Free Negative Affectivity Scale (Fortunato & Stone-Romero, 1999) translated and adapted to the Italian context.

Interpersonal conflict scales and psycho-physical strain scales were obtained from Q_u-Bo (De Carlo et al., 2008).

Interpersonal conflict (Rahim, 2001) was measured using 15 items on a 6-point Likert scale (1 = *strongly disagree*, 6 = *strongly agree*) and divided into conflict with superiors (nine items, sample item "it is hard to work with my supervisor"; $\alpha_{\text{sample A}} = .86$; $\alpha_{\text{sample B}} = .80$) and conflict with colleagues (six items, sample item "between my colleagues and me there is dislike"; $\alpha_{\text{sample A}} = .73$; $\alpha_{\text{sample B}} = .77$).

Psycho-physical strain (Goldberg, 1978; Kristensen, Hannerz, Høgh, & Borg, 2005) was measured by 36 items on a 6-point Likert scale (1 = *never*, 6 = *every day*) and divided into five dimensions: depressive symptoms (11 items, sample item "waking up already tired"; $\alpha_{\text{sample A}} = .80$; $\alpha_{\text{sample B}} = .78$), symptoms of anxiety (eight items, sample item "feeling tense, tight, nervous";

$\alpha_{sample\ A}$ = .82; $\alpha_{sample\ B}$ = .81), gastrointestinal disorders (six items, sample item "stomachache"; $\alpha_{sample\ A}$ = .74; $\alpha_{sample\ B}$ = .82), cardiovascular disorders (three items, sample item "throat closure"; $\alpha_{sample\ A}$ = .79; $\alpha_{sample\ B}$ = .75), and ergonomics disorders (eight items, sample item "burning eyes"; $\alpha_{sample\ A}$ = .76; $\alpha_{sample\ B}$ = .71).

Finally, in relation to negative affectivity (Watson & Clark, 1984), the Strain-Free Negative Affectivity Scale was used (Fortunato & Stone-Romero, 1999), adapting the items to the Italian context. The one-dimensional scale consists of 13 items on a 6-point Likert scale (1 = *strongly disagree*, 6 = *strongly agree*).

The scale measures the style of the subject's emotional reaction against adverse environmental conditions, associated with both work and private life. This is in line with the theoretical formulation proposed by Watson (Watson & Clark, 1984; Watson et al., 1988, 1999), in which high-NA individuals are characterized by a greater reactivity to negative stimuli and a greater propensity to respond in terms of negative emotions. The authors also formulated items that do not take into account physical symptoms or psychological strain. This should allow to avoid the conceptual and empirical overlap between measures of strain and negative affect.

Statistical Analysis

In order to evaluate the metric properties of the Strain-Free Negative Affectivity Scale, a confirmatory factor analysis was performed using Lisrel 8.8 software (Jöreskog & Sörbom, 1993).

We assessed model fit using the χ^2 test, root mean square error of approximation (RMSEA), comparative fit index (CFI), non-normed fit index (NNFI), and standardized root mean square residual (SRMR). In accordance to Schermelleh-Engel, Moosbrugger, and Müller (2003), we considered the following cutoff values:

- RMSEA: values below .05 indicate a good fit, values between .05 and .08 indicate an acceptable fit;
- CFI: values above .97 indicate good fit, values between .95 and .97 indicate an acceptable fit;
- NNFI: values above .97 indicate good fit, values between .95 and .97 indicate an acceptable fit;
- SRMR: values below .05 indicate a good fit, values between .05 and .10 indicate an acceptable fit.

The four different hypothesized causal models were tested using structural equation modeling with latent variables.

In relation to the measurement model, the solution described below has been adopted. For the multi-dimensional constructs of strain and interpersonal conflict, we created parcels of scale items.

For the strain scale, we created five parcels that reflect the dimensions comprising the construct of strain, namely depressive symptoms, anxiety symptoms, gastrointestinal disorders, cardiovascular disorders, and ergonomic disorders. For each parcel we used the average score in the specific sub-scale (internal-consistency approach; Kishton & Widaman, 1994). For interpersonal conflict we created two parcels, one for the dimension of conflict with colleagues and another for the dimension of conflict with superiors. This approach allows to preserve the multidi-

mensionality of the construct, to limit measurement error and to maintain a favorable relationship between participants and parameters to be estimated (Bagozzi & Heatherton, 1994; Little, Cunningham, Shahar, & Widaman, 2002). Negative affectivity was measured using the individual items of the SFNA scale as observed variables.

The common cause model (Model 1) was specified by freely estimating the NA → interpersonal conflict and NA → strain paths, while fixing to zero the interpersonal conflict → strain path. The regression model (Model 2) was specified by freely estimating the NA → strain and interpersonal conflict → strain paths, while fixing to zero the NA → interpersonal conflict path. The total mediation model (Model 3) was specified by freely estimating the NA → interpersonal conflict and interpersonal conflict → strain paths, and by fixing to zero the NA → strain path. Finally, the partial mediation model (Model 4), the least parsimonious model among those tested, was specified by freely estimating all paths.

The estimated structural models are represented graphically in Figure 1. For the sake of brevity the part relative to the measurement model is omitted. In relation to the models of mediation, the names given to each path — a, b, c, and c' — by Baron and Kenny were used (1986). Path a represents the effect of the independent variable on the mediator, whereas path b is the effect of the mediator on the outcome variable. Path c is the total effect, whereas path c' is the direct effect.

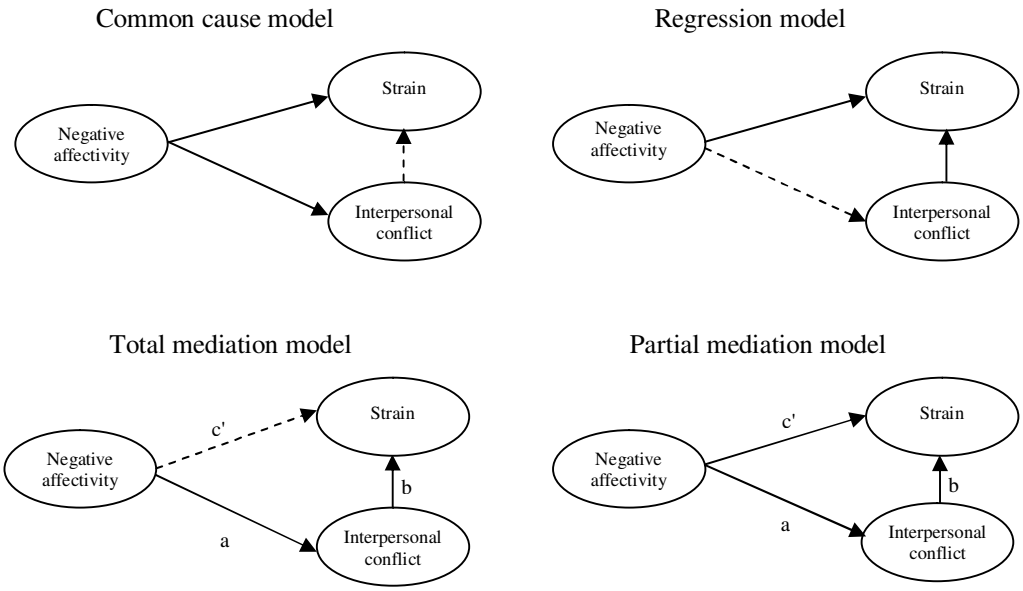


FIGURE 1
The four structural models tested in the study.

The common cause model, the regression model, and the full mediation model are hierarchically nested in the partial mediation model. The hypotheses were tested by comparing the fit of Models 1-3 to the fit of the partial mediation model, the less parsimonious model, using the chi-square difference statistic (χ^2_D), which tests the null hypothesis of identical fit between two nested models (Kline, 2005; Wheaton, 1987).

The partial mediation model is supported only in the case of a better fit compared to all the other tested models. If one of the alternative models shows a fit which does not differ from that of the partial mediation model, then the more parsimonious model is supported. If two or more alternative models show a fit that is not different from the partial mediation model, then the two models are compared with each other using the other fit indices examined.

RESULTS

First, an initial confirmatory factor analysis was conducted on the sample of organization A (hereafter, sample A) in order to test the single factor structure of the SFNA. The indices showed a poor fit of the theoretical model to the data: $\chi^2(65, N = 371) = 1647.625$, $p < .001$; RMSEA = .190; NNFI = .264; CFI = .386; SRMR = .132. The items with low factor loadings were therefore eliminated (standardized λ less than or equal to |.30|). In this way, the number of items was reduced drastically from 13 to five. The analysis of the modification indices also suggested that we should freely estimate the correlation between two error terms (items 142 and 139). This is justifiable from the theoretical point of view, given the overlap of the content of the two items. Then a new confirmatory factor analysis was conducted. The fit indices showed a good fit of the theoretical model to the data: $\chi^2(4, N = 371) = 14.446$, $p < .01$; RMSEA = .081; NNFI = .983; CFI = .993; SRMR = .023. We noted only a slightly high value for RMSEA, an index that depends on χ^2 (Kline, 2005). This may be due to the fact that the items were not normally distributed, and it may determine an overestimation of χ^2 using maximum likelihood as the estimation method (Mîndrilă, 2010). For this reason the scale was tested again by using the robust maximum likelihood, suitable for non-normal data (Satorra & Bentler, 1994). The fit indices confirmed a good fit of the theoretical model to the data: χ^2 (4, $N = 371$) = 5.266, $p = .26$; RMSEA = .029; NNFI = .998; CFI = .999; SRMR = .024. The factor loadings of the 5-item scale are shown in Table 1. The internal consistency of the scale, as estimated through Cronbach's coefficient α, was very good ($\alpha = .90$).

TABLE 1
Strain-Free Negative Affectivity Scale

Item	λ
138. My colleagues are more concerned than me when there are bad news.	0.82
139. Crisis situations, even serious ones, do not worry me.	0.84
140. I resent it very much if someone gets positive comments that, actually, I deserve.	0.89
141. My colleagues are less irritated than me if the job is not as expected.	0.60
142. When I am assigned a difficult project, I am very worried.	0.77
$\chi^2(4, N = 371) = 5.266$, $p = .26$; RMSEA = .029; NNFI = .998; CFI = .999; SRMR = .024	

Before proceeding with the analysis of the structural models, a CFA was conducted in order to test the adequacy of the complete measurement model (Aberson & Gaffney, 2009). This

model comprises three latent variables (strain, interpersonal conflict, and negative affectivity), which are allowed to covariate, and twelve observed variables, namely, five items from SFNA for negative affectivity, two parcels of scale items for interpersonal conflict (conflict with colleagues and conflict with superiors) and five parcels of scale items for strain (depressive symptoms, anxiety symptoms, gastrointestinal disorders, cardiovascular disorders, and ergonomic disorders).

The overall results indicated a good fit for the measurement model in both sample A — $\chi^2(50, N = 371) = 96{,}664$, $p < .001$; RMSEA = .053; NNFI = .985; CFI = .989; SRMR = .037 — and B, $\chi^2(50, N = 749) = 143{,}743$, $p < .001$; RMSEA = .051; NNFI = .984; CFI = .988; SRMR = .036. In the second sample analyzed, the modification indices suggested that we should freely estimate the correlation between two error terms (items 142 and 141). This is justifiable on a theoretical point of view because both items shared the same polarity, which acts as an effect method (Podsakoff et al., 2003).

The loadings were high and significant in both sample A ($\lambda s \geq .56$, $ps < .01$) and B ($\lambda s \geq .50$, $ps < .01$). Finally, the correlations between latent variables (Table 2) were positive and significant and ranged in intensity between .25 and .48 in sample A, and between .25 and .51 in sample B, indicating that latent variables were mutually distinct.

TABLE 2
Correlations between latent variables

		Sample A (N = 371)		
		Strain	Interpersonal conflict	Negative affectivity
Sample B (N = 749)	Strain	1	.48	.28
	Interpersonal conflict	.51	1	.25
	Negative affectivity	.29	.25	1

Note. Correlations for sample B are presented below the diagonal, for sample A above the diagonal.

Then, the four structural models were tested. Table 3 shows the fit indices for each model, and the relative values of the chi-square difference statistic between the partial mediation model and models 1-3, in both sample A and B.

As noted in the chi-square difference statistic, the partial mediation model showed a better fit to the data than the other models tested, in both sample A and B.

The significance of the indirect effect a*b was therefore tested using the Sobel test (Preacher & Hayes, 2004; Sobel, 1982). The indirect effect (see Table 4) was positive and significant in both samples ($z_{\text{sample A}} = 3.21$, p = .001, $z_{\text{sample B}} = 4.66$, $p < .001$).

Some authors suggested the use of alternative methodologies to the one proposed by Sobel, which is based on assuming normality of the distribution of the product of coefficients a*b. This assumption is often violated, especially in small- and medium-sized samples (MacKinnon, Lockwood, & Williams, 2004; Preacher & Hayes, 2008).

TABLE 3
Comparison of the fit indices for the tested models

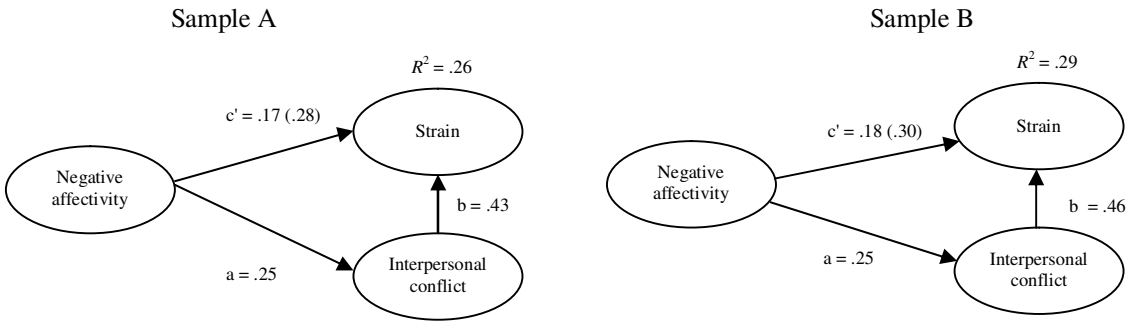
Sample A (N = 371)								
Model	χ^2	*df*	RMSEA	NNFI	CFI	SRMR	χ^2_D	*p*
Common cause (Model 1)	145.309	51	.071	.970	.977	.095	48.645	< .001
Regression (Model 2)	111.682	51	.058	.981	.985	.067	15.017	< .001
Full mediation (Model 3)	105.771	51	.057	.983	.987	.059	9.107	= .003
Partial mediation (Model 4)	96.664	50	.053	.985	.989	.037	–	–
Sample B (N = 749)								
Model	χ^2	*df*	RMSEA	NNFI	CFI	SRMR	χ^2_D	*p*
Common cause (Model 1)	249.435	51	.071	.966	.974	.096	105.693	< .001
Regression (Model 2)	172.016	51	.056	.979	.984	.069	28.273	< .001
Full mediation (Model 3)	163.761	51	.055	.981	.985	.054	20.018	< .001
Partial mediation (Model 4)	143.743	50	.051	.984	.988	.036	–	–

TABLE 4
Indirect effect of NA on strain through interpersonal conflict, non-standardized coefficients

	Indirect effect	SE	Z	*p*	95% confidence interval (Sobel, 1982)		95% confidence interval (McKinnon et al., 2007)	
					Low	High	Low	High
Sample A	.095	.030	3.205	= .001	.037	.153	.035	.170
Sample B	.102	.022	4.659	< .001	.059	.145	.061	.148

MacKinnon et al. (2007) proposed a methodology taking into account the non-normal distribution of the product of coefficients a*b in calculating the "asymmetric" confidence interval. The significance of the indirect effect was tested using PRODCLIN software (MacKinnon et al., 2007). The results, reported in Table 4, showed that the 95% confidence interval for indirect effects does not contain zero in either sample A or sample B.

Overall, we can therefore conclude that NA exerts both a direct effect on strain and an indirect effect through interpersonal conflict. Hypothesis 4 is supported, while hypotheses 1-3 are not confirmed. Figure 2 depicts the structural model of the partial mediation model. To facilitate the interpretation of the results, standardized coefficients are showed. The values presented are therefore not comparable with those in Table 4.



Note. In parentheses the total effect "c" is reported. All paths are significant, $p < .01$.

FIGURE 2
Partial mediation model, structure model.

DISCUSSION

The first objective was to evaluate the metric properties of an Italian adaptation of the SFNA scale (Fortunato & Stone-Romero, 1999). The tests carried out did not allow to completely confirm, in the sample examined, the structure of the single factor model originally proposed by the authors. This may be ascribable to the fact that some of the items excluded from the Italian adaptation of the SFNA scale, because of translation reasons or due to the specificity of the Italian cultural context, have a semantic connotation similar to other constructs. The use of a limited number of items derived from the SFNA may have likewise partially influenced the results pertaining to the tested models.

On the one hand, additional administrations are therefore required in view of a final validation of the scale in the Italian context. The effort in this direction can be justified by the fact that the correlation between the SFNA and the strain measure used in this work is small (Φ_{31}= .28 in sample A; Φ_{31}= .29 in sample B), suggesting a limited conceptual and empirical overlap between the two constructs. It is also noticeable that the SFNA fits well, in terms of the creation of items, for the use in the workplace. On the other hand, before reaching any final decisions on the goodness of some models and the inadequacy of others, results should be replicated in other samples, also using other NA scales.

In the present study, some of the most frequently examined models on the role of NA in the formation of work stress were then tested. The results do not allow to support the common cause model, which shows the worst fit to the data among those considered. NA explained a small proportion of variance of interpersonal conflict and strain (less than 10% in both samples for both constructs), but this is not sufficient to conclude that it only has a role of disturbance in

the evaluation of work stress. This, indeed, would be a clear conclusion, which requires strong arguments at both theoretical and empirical level (Spector, Zapf, et al., 2000).

In this regard, one advantage of this study is the use of structural models with latent variables. This allows to estimate measurement errors and to examine the structural model excluding such errors (Podsakoff et al., 2003). However, this approach is not common in previous studies examining the role of NA in the formation of work stress, which primarily focused on the observed variables (partial correlations, multiple regression analysis) and could not distinguish between the measure of a construct and the construct itself (Williams et al., 1996). It is thus impossible to determine whether and to what extent NA has a role of disturbance at the level of the constructs (as in the common cause model) or at the level of the measures used to detect stressors and strain. As already noted, in fact, there is an overlap between some conceptual and empirical measures of NA and strain (Fortunato & Stone-Romero, 1999). In light of these considerations and findings it would be inappropriate to study the relationship between stressors and strain by controlling for the effect of NA.

The results failed to support the regression model, in which NA and interpersonal conflict were considered to be independent predictors of strain. The regression model is close to the classic models in the literature, which identify a number of stressors as antecedents of strain (Karasek, 1979; Osipow, 1998). The model allows to explain a significant proportion of the variance of strain (about 25% in both samples), an interesting result in light of the limited number of studies that examine interpersonal conflict and NA as predictors of strain. However, given the pervasiveness of NA, resulting in a tendency to see oneself and the world through a negative perspective, it seems unlikely that only NA may exercise a direct effect on strain without affecting the perception of the workplace.

The last two models tested – the full mediation model and the partial mediation model – assume an indirect effect of NA on strain through the perceived stressors. The results allow to support the partial mediation model, in which NA exerts both a direct effect on strain and an indirect effect through interpersonal conflict. Therefore, high-NA individuals perceive higher levels of conflict with their colleagues and superiors, which then affect work stress. It is clear that the partial mediation model can explain a share of the variance in strain between 25% (sample A) and 29% (sample B), a value consistent with the findings in the meta-analysis conducted by Thoresen et al. (2003).

These results have important consequences, in both theory and application. They seem to confirm the hypothesis of Spector, Zapf, et al. (2000), according to which NA influences the perception of the psycho-social context in which workers are situated and, indirectly, strain. This is particularly interesting when one considers that, to the best of our knowledge, only few studies tested this hypothesis. Traditionally, in fact, research on work stress had focused more on the objective characteristics of work (job demand/control, time pressure, organizational constraints), or the relationship between workers and their role (role conflict, role ambiguity), than on interpersonal relationships – positive or negative – that emerge in the organizational context. In this perspective, the study of the NA, and of individual differences in general, can be furthered, as it may help to better understand the process of interaction between individuals and their work environment. This, in its turn, leads people to build and interpret their psycho-social context which, ultimately, helps to determine both positive outcomes (job satisfaction, organizational citizenship

behaviors, organizational commitment) and negative ones (strain, turnover intentions, counter-productive work behavior).

In an applicative perspective it is appropriate, in the authors' opinion, to carefully plan the assessment phase of work stress and the possible interventions aimed to improve current conditions and promote organizational well-being.

Ideally, work stress should be assessed by also using, besides the usual self-report measures of stressors and strain, (a) hetero-evaluations of the work environment, carried out by direct supervisors or employees who share the same working group, and (b) objective indicators of stress, such as sickness absences or accidents. The integration of different methods, advocated by many researchers (Cox et al., 2000; Grebner et al., 2005; Semmer, Grebner, & Elfering, 2004), would grant more complete information within the organizational reality, enhancing both the individual workers' perceptions and the details at a "macro" level, relative to the entire organization or individual production departments.

If this is not possible and the evaluation of work stress is performed exclusively via self-reports, negative affectivity should be assessed alongside the usual measures of stressors and strain, while collecting as much information as possible about job type or workgroup membership. This may help to identify, on the one hand, some "average" features of work environment common to a specific group of workers, regardless (as much as possible) of individual workers' perceptions and resources. Moreover, since it is known that high-NA individuals are more stressed and tend to perceive their work environment more negatively, it is possible to obtain specific information about a group of workers naturally "predisposed" to experience stress situations. This may involve conducting specific analyses on the group of workers with high NA, in order to identify and understand specific mechanisms that can lead to the formation of stress at work in this sub-group of workers. It is also possible, if the anonymity of respondents is maintained, to identify working groups in which individuals are at risk, intervening in advance to improve the interactions between colleagues and between superiors and subordinates.

Among the limitations of the present work are the exclusive usage of self-report measures and the cross-sectional research design. As regards the former, the intensity of the observed relationships may be distorted by the common method variance (Podsakof et al., 2003). In the future we may integrate within the same research design also strain measures that go beyond workers' subjectivity, such as the assessment of symptoms by physicians, or sickness absences. The simultaneous assessment of both dependent and independent variables does not allow to clarify the direction of causality, either. In addition to the partial mediation model contemplated in this study, there are alternative models involving different causal paths, distinguishable, in terms of goodness of fit to sample data, from the partial mediation model (MacCallum, Wegener, Uchino, & Fabrigar, 1993). It is possible that stressed workers perceive their work environment more negatively, or that the presence of chronic stress may result, in the long run, in increased NA (causality mechanism; Spector, Zapf et al., 2000). However, we favored the path considering interpersonal conflict as the mediator of the relation between negative affectivity and psycho-physical strain because it is the one in better accordance with the reference literature (Kaplan, Bradley, et al., 2009).

A future longitudinal design could, however, help to clarify the direction of causality. Finally, the model of Watson and Clark (1984) provides two orthogonal dimensions, NA and PA.

Few studies have examined the role of PA in the formation of stress at work, an aspect that would be worth exploring in future investigations.

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