



## How innovation can alleviate negative consequences of demanding work contexts: The influence of climate for innovation on organizational outcomes

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This study examines climate for innovation as a method by which negative organizational consequences of demanding work may be lessened. It was expected that a climate for innovation would enable employees to develop coping mechanisms or improved work-related processes which counteract negative consequences of work demands. Extending the job demands–resource model (Karasek, 1979), we predicted and found that among the sample of 22,696 respondents from 131 healthcare organizations, organizational climate for innovation alleviated the negative effects of work demands on organizational performance. Thus, this study informs climate theories and guides practitioners' efforts to support the employees.

Researchers and practitioners of organizational psychology agree that work can be overwhelming in its demands. It is common for employees to lack the resources necessary to meet the requirements of their job, feel uncertain about their job and work long hours without respite. The stress associated with these demands has been shown to have multiple negative consequences for individuals (see Warr, 1999). Despite its intuitive significance, less is known about the consequences of demanding work aggregated to the organizational level of analysis (Bliese & Jex, 2002). On one hand, organizations in which the individuals encounter demanding work may extort the most that employees can offer. On the other hand, organizations in which employees feel weighed down by the demands of their jobs may be less efficient and successful.

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Moreover, the context of the workplace is likely to influence how the employees perceive, experience and react to work demands (Bliese & Jex, 2002). From both research and practical perspectives, it is important to consider how organizations can alleviate any negative outcomes that may be associated with demanding work.

The job demands–resource model, founded on Karasek's (1979) demands–control model, suggests that the consequences of demanding work conditions can be offset by available resources (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001) including job control (Ganster, Fox, & Dwyer, 2001), job efficacy (Schaubroeck & Merritt, 1997) or personality characteristics (Parker & Sprigg, 1999; Perrewe, Zellars, Ferris, Rossi, Kacmar, & Ralston, 2004). Preliminary research suggests that innovation may be another means by which organizations can help individuals compensate for stress (Bunce & West, 1996). In particular, the authors argued that a training intervention focused on the promotion of innovation would be related to employees' ability to change and improve their working conditions. Furthermore, the authors suggested that innovation might generate procedures and ideas which enhance productivity. Although this research was an important first step in proposing that innovation can alleviate the negative consequences of work demands, it was limited in its focus on the individual consequences of a training intervention. The extent to which organizations promote innovation may be better conceptualized through the construction of organizational climate for innovation, or as the shared perceptions of the values, norms and practices of the organization with regards to innovation.

The current research examines whether an organization's climate for innovation moderates the relationship between work demands and organizational performance within the framework of the job demands–resource model of stress. We first extend research-linking work demands and the individual well being to the well being (i.e. performance) of the organization. We also consider the extent to which climate for innovation is directly related to external ratings of organizational performance and discuss the nature of the relationship between work demands and innovative climate. Finally, we investigate climate for innovation as a method by which the negative effects of work demands on organizational performance may be alleviated.

### **Work demands**

Consonant with previous research from a stress and coping framework (e.g. Lazarus, 1966), Demerouti and colleagues (Demerouti *et al.*, 2001) defined stress as an external disruption in the equilibrium of an individual's cognitive, emotional, environmental system. The basic assumptions of the stress and coping model suggest that individuals respond to stressors as a function of their coping skills and resources (e.g. social support). Extending this framework to the context of work and the experience of demanding work as a stressor, the job demands–resource model suggests that there are physical, social and structural components of jobs that either 1) require sustained effort and are associated with costs or 2) functional in achieving goals, reducing demands and costs, and stimulating personal growth. The former component constitutes job *demands*, while the latter comprises job *resources*. In other words, we view the construct of job demands as an indicator of the extent to which a job has challenging or exigent requirements.

At a broad level, job stress has been linked with a myriad of antecedents and consequences. Job demands, as a specific type of job stressor, have been shown to relate to exhaustion (Demerouti *et al.*, 2001), decreased learning (Parker & Sprigg, 1999) and

job satisfaction (Warr, 1999) at the individual level of analysis. Although preliminary theorizing has encouraged researchers to examine such stressors at higher levels of analysis (Bliese & Jex, 1999), virtually no empirical work has considered the demands of work as a descriptive characteristic of an organization as a whole. In the current study, we conceptualize demands at the level of the organization as the collective total of perceptions of insufficient time and energy to meet the demands of work. The extent to which an organization is characterized by such demands is likely influenced by the internal factors such as management style and performance targets, as well as the external forces such as customer demands and market environments.

Moreover, there are likely meaningful consequences for organizations in which perceptions of demanding work are additively high. To the extent that individuals in an organization tend to perceive demanding conditions in their work, the effectiveness of the organization as a whole might be impacted. Although there may be arguments to suggest that demanding work can help organizations to succeed (i.e. maximizing inputs), there is no empirical evidence at the organizational level of analysis from which to derive expectations. In other words, although research suggests that the performance of individuals who experience moderate amounts of demands does not necessarily suffer when the consequences of demanding work at the organizational level is unknown. We subscribe to Ganster and colleagues' (2001) suggestion that demanding work can result in burnt-out, low-functioning workers (Demerouti *et al.*, 2001). In other words, we anticipate that organizations in which employees collectively tend to perceive that they have insufficient time and energy to meet the demands of work will be less effective overall than organizations in which employees do not perceive work to be demanding. In other words, we expect that

*H1:* The extent to which organizations contain demanding work contexts will be negatively related to organizational performance.

### **Climate for innovation**

The past decade has seen an increase in interest in organizational climates as meaningful contextual elements of organizational systems. Broadly, psychological climates have been described to encompass perceptually based descriptions of relevant organizational features, events, practices and processes (Jones & James, 1979). Climate can also be understood as an intervening variable between the context of an organization and the behaviour of its members (Patterson *et al.*, 2005). When consensus or shared perceptions about these characteristics of an organization emerge among members of organization, an organizational climate may be formed (Joyce & Slocum, 1984). Some climate research considers the degree of consensus or variability within organizations (i.e. climate strength) rather than the variability across organizations (i.e. climate), which is of focus in the current research (see Schneider, Salvaggio, & Subirats, 2002). Although theorists examine global organizational climate (Patterson *et al.*, 2005), recent climate research tends to focus on specific climates according to a particular area of interest. For example, studies including climate for teamwork (Lindell & Brandt, 2000), climate for work-family balance (Thompson, Beauvais, & Lyness, 1999) and climate for gender equity (King, Hebl, George, & Matusik, 2006) have found that each climate dimension has meaningful consequences.

One important dimension of organizational climate that has received limited research attention is an organization's climate for innovation (Amabile, Conti, Coon, Lazenby, & Herron, 1996; Gonzalez-Roma, Peiro, & Tordera, 2002; West & Anderson, 1996; West &

Wallace, 1991). Innovation can be defined as the intentional process of development and application of ideas, processes, products or procedures that are novel and designed to yield positive outcomes (from West & Farr, 1990; Gonzalez-Roma & West, 2004). Amabile (1988) and her colleagues (1996) proposed organizational climate for creativity (which is a fundamental component of innovation) includes elements such as encouragement of creativity, autonomy and resources. Extending this description to innovation, an organizational climate for innovation can be defined as the extent to which the values and norms of an organization emphasize innovation (West & Anderson, 1996; West & Wallace, 1991). Although little is known about the organizational consequences of climate for innovation, and early investigations of creativity focused on the individual level of analysis (see Amabile, 1996), research has begun to follow a multi-level approach in establishing that innovation is crucial in the long-term survival of organizations (Anaconda & Caldwell, 1987; Anderson, de Dreu, & Nijstad, 2004; Drazin, Glynn, & Kazanjian, 1999; Janssen, Van de Vliert, & West, 2004; Oldham & Cummings, 1996). For example, multiple measures of innovation were positively related to organizational effectiveness within the health care industry (West & Anderson, 1996). Damanpour's (1991) meta-analysis showed that managerial attitudes towards change were determinants of organizational innovation. Similarly, we expect that maintenance of a climate which supports the production and implementation of creative ideas or processes will be related to the performance of organizations. Specifically, organizations that actively gather new ideas provide practical support in their implementation and use feedback about their consequences will be more efficient, productive and flexible to the changing needs and contexts of customers and clients. Thus,

H2: The extent to which organizations maintain supportive climates for innovation will be positively related to organizational performance.

### **Relationship between work demands and innovation**

In examining the demanding work and the climate for innovation as predictors of organizational performance, it is important to consider whether the predictors are expected to be independent or related. Although we are aware of no other research that investigates the link between demanding work and *climate for* innovation, several studies have examined the demands-*innovation* relationship. There is evidence that work demands and challenges are generally positively related to innovation (e.g. West & Anderson, 1996; West, Shackleton, Hardy, & Dawson, 2005b), though it is important to note that this relationship may depend on the degree of demands (Amabile, 1988; Amabile *et al.*, 1996; West *et al.*, 2005b), the stage of the innovation process (West, 2002; West *et al.*, 2005b), task focus and objective clarity (West, Dawson, Utsch, & Borrill, 2005a), or the perceived fairness associated with efforts and rewards (Janssen, 2000).

Despite these qualifications, theory that bolsters expectations for a positive relationship suggests that creativity and idea generation may be triggered by work problems or challenges. In other words, the effort it takes to implement creative ideas may be motivated by external demands (West, 2002). More specifically, innovation may be classified as a form of problem-focused coping in which workers cope with problems by modifying their work environment (Janssen, 2000). These modifications might include changes in task objectives, methods, approaches, designs, and coordination and communication processes (see Janssen *et al.*, 2004). Janssen and colleagues summarized

the state of the research in this area by writing, "In effect, research findings suggest that if the environment of teams is demanding and uncertain, it is likely they will have to innovate successfully in order to reduce the uncertainty and level of demand" (p. 138).

The authors (Janssen *et al.*, 2004) go on to specify that in the absence of a supportive climate, these innovations are likely to be met with resistance (Janssen, 2003). In other words, innovations are expected to be successful in responding to challenging work only to the extent that organizations support innovation (West & Anderson, 1996). This proposition and the research that supports it points to the distinction between innovation and organizational climate for innovation, and suggests that their associations with work demands may not be identical or even parallel. Whereas previous research suggests that there is a positive link between demanding work and innovation, there is no such evidence to support a similar link between work demands and climate for innovation. Instead, organizations which demand a great deal from their members may be less supportive of deviations or changes from the work processes, procedures, and contextual factors that accompany or create the demands. In other words, work demands could be positively related to innovation, but negatively related to organizational climate for innovation. Given the lack of previous research in this area, it would be difficult to make a definitive hypothesis about the expected relationship between work demands and climate for innovation. Thus, we will examine the relationship in an exploratory manner without making explicit hypotheses about its directionality. Apart from the direct relationship between work demands and climate for innovation, we anticipate that each will impact organizational performance.

#### ***How climate for innovation can ameliorate consequences of work demands***

Given the prevalence of demanding work, and the negative individual and organizational consequences expected to follow from such work, it is critical for researchers and practitioners to investigate methods by which to limit these outcomes. Previous research that is limited to the individual level of analysis generally fails to consider contextual influences on the effects of work demands (Bliese & Jex, 2002). Extending the job demands-resource model, organizations may be able to respond to job demands by offering resources for coping. Although there is some evidence to suggest that social support can alleviate job stress (Cohen & Wills, 1985), additional research makes the opposite conclusion, which support exacerbates the negative effects of stress (Kaufmann & Beehr, 1986). These contradictory results suggest that social support may not always do enough to help employees cope with the demands of work. Organizations may need to go beyond the provision of psychosocial support and also support employee innovation.

In particular, we argue that organizations which create and maintain an innovative climate can alleviate a portion of the negative consequences of demanding work. In a manner similar to the previously studied constructs of decision latitude and control, a climate for innovation may enable the employees to develop novel individual coping mechanisms or improved work-related processes that counteract the negative consequences of work demands. Bunce and West (1996) followed person-environment fit theories to explain that under conditions of excessive workloads, the employees can improve fit by revising the methods or by seeking training. The authors also argued that, like control in the job decision latitude model (Ganster *et al.*, 2001), innovation is linked with discretion and may allow individuals to adapt when entering new roles in a changing environment. Organizations that support change initiatives, or encourage the

development and application of new ideas, may enable their workforce to cope with exigent requirements of their jobs. As an example, nurses who feel that they do not have enough time to care for all the patients assigned to them (i.e. job demands) may be rushed in their interactions with patients (i.e. leading to decreased organizational performance). If these nurses were employed by an organization that supported the development of novel patient services strategies (i.e. climate for innovation), they may be empowered to develop strategies for more efficient distribution of workloads or paperwork systems. Following this theoretical rationale (see also Bunce & West, 1996), we theorize that innovative climates may act as a resource or support function by which employees can manage job demands. Consequently, we expect that

*H3:* The relationship between job demands and organizational performance will be moderated by climate for innovation such that climates supportive of innovation will alleviate the negative effects of demanding work on organizational performance.

In summary, we expect that work demands and climate for innovation will be directly related to organizational performance. We further expect that the relationship between work demands and performance will be more negative in organizations that are unsupportive of innovation than in organizations which are supportive of innovative efforts. The hypothesized relationships will be tested with a sample of multiple sources of information at the organizational level of analysis.

## **Method**

### ***Participants and procedures***

The Commission for Health Improvement (CHI) was set up by the UK Government in recent years to monitor the performance of organizations within the National Health Service (NHS). As part of their 4-yearly inspection of each healthcare organization, they began to survey staff a few weeks prior inspections in 2001. The questionnaire used was developed, and for the first few months administered, by researchers at Aston University.

All the healthcare organizations were required to be surveyed as part of their inspection; as such, we have data for 136 organizations from the year 2002. This includes 66 acute trusts (hospitals or groups of hospitals), 16 mental health trusts, 29 ambulance trusts, 20 primary care trusts (groups of GP practices/local health centres) and 5 NHS Direct trusts (call centres in which nurses provide clinical advice over the telephone). In each organization with over 1000 staff, a random sample of 500 was sent to the survey. In organizations with fewer than 1000 staff, a random sample of 50% was sent the survey. In total, data were available from 24,205 respondents (42.7% response rate). Since NHS Direct trusts operate as call centres and are very distinct from other trust types, they were removed from all analyses. Thus, the bivariate analyses reported here are based on a sample of 22,696 respondents from 131 organizations (28% male and 72% female). Data were available for every control, predictor and criterion variable in 91 cases; thus, the multivariate analyses reported here at the organizational level of analysis are based on a sample size of 91. The mean age of these respondents was 40.58 years ( $SD = 12.35$ ). The respondents were distributed broadly across positions including medical and dental, administrative and clerical, nursing and midwifery, ambulance technician, paramedic, scientific and managerial roles. The majority of the respondents were British (86%), while an additional 6 and 2% were from Asian and African backgrounds, respectively. This sample was broadly representative of the NHS as a whole in terms of gender, ethnicity, age and occupational groupings.

### **Measures**

As part of the larger survey, the participants provided their responses to a number of scales that serve as the predictor variables in this study. Characteristics of each healthcare organization are available to the public as reported by the NHS. The criterion variable, organizational performance, was provided by trained raters from the NHS.

#### *Control variables*

To control for variability in performance due to the size (i.e. number of employees), type (i.e. acute, mental health, ambulance, primary care) and income (i.e. pounds per year) of each organization, this data was collected from the NHS.

#### *Work demands*

Seven work demands items were included in the survey (adapted from Caplan, 1971; See Appendix A). A sample item is, 'I do not have enough time to complete all the responsibilities of my job.' The response scale was a 5-point Likert-type scale anchored with 1 (*Not at All*) and 5 (*A Great Deal*). An exploratory factor analysis with promax rotation was utilized to test for unidimensionality of these items. Following Kaiser's rule and Cattell's scree test, a one-factor solution emerged such that the first factor accounted for 60.05% of the variance (Eigenvalue=4.20, Cronbach's  $\alpha = .89$ ). Thus, a 'Work Demands' scale was created as the average response to the seven items.

It was recognized that levels of work demands varies considerably between staff in different occupational groups (e.g. nursing, scientific and dental, manager, paramedic), and an analysis of variance confirmed this ( $F(13) = 28.89, p < .001$ ). Since the composition of organizations differed significantly in terms of occupational groups, a simple aggregation to the organizational level would not necessarily provide a fair comparison. Therefore, each individual's score was adjusted by the mean level of his or her occupational group before these scores were aggregated across individuals to the organizational level of analysis. This way, the organizational work demands score provides an insight into average level of work demands within an organization relative to the expected work demands of an organization with the same occupational composition.

Justification for aggregation generally requires evidence that there is an appropriate amount of within- and between-group variability. Since work demands are features of individuals' experiences, rather than an aspect of climate, we neither require nor expect that there will be high levels of agreement within organizations ( $M_{rwg} = .54, Min_{rwg} = .08, Max_{rwg} = .83$ ). Instead, the value of the ICC(2) (.75) was used to test the reliability of the work demands measure and supports the use of this scale. We conceptualize work demands as a configural unit property, and measured the mean value as an indicator of the average level of work demands rather than an overall characteristic of the organization (see Bliese, 2000 for an explanation). As compared with global and shared unit properties, configural unit properties are those that emerge from the characteristics, behaviours or cognitions of members of the unit that encompass variability or patterns of individual characteristics, constructs, or responses across members of a unit (Kozlowski & Klein, 2000). Properties such as work demands originate at the individual level but are not assumed to converge, instead capturing various individual contributions to the unit. Measurement of configural unit properties depends on the theoretical processes by which the individual characteristics are

expected to emerge at the group level. Whereas agreement is expected in global and shared unit properties, there need not be consensus in member responding for configural unit properties. In summary, we aggregated individual reports of work demands to the organizational level after controlling for occupational group differences. Thus, the variable of organizational work demands represents the mean level of individuals' experiences of demanding work within an organization across occupational groups.

#### *Climate for innovation*

Nine items developed in previous research (Anderson & West, 1998; Patterson *et al.*, 2005) were used as indicators of each organization's climate for innovation (see Appendix B). Since the novel ideas, processes and procedures useful to the service-oriented organizational contexts utilized in this research are often inherently patient based, many of the items refer to patient services. A sample item is, "People in the organization are always searching for new ways of delivering patient services." The response scale was a 5-point Likert-type scale anchored with 1 (Strongly Disagree) and 5 (Strongly Agree). We first conducted an exploratory factor analysis with promax rotation to test the unidimensionality of the items. Following the Cattell scree test and Kaiser's rule, a one-factor solution emerged such that the first factor accounted for 61.88% of the variance (Eigenvalue=5.57, Cronbach's  $\alpha = .92$ ). Thus, a 'Climate for Innovation' scale was created as an average of each participant's responses to the nine items. Whereas the construct of Work Demands was conceptualized as a configural property, Climate for Innovation is theorized to emerge through a consensus model. In order to justify aggregating this scale to the organizational level analysis, we tested the within-group consistency using the  $r_{wg}$  statistic. The resulting values suggest that there was adequate agreement among employees within organizations to justify aggregation ( $M_{rwg} = .94$ ,  $Min_{rwg} = .86$ ,  $Max_{rwg} = .97$ ). Aggregation was also supported by the ICC(1) (.12) and ICC(2) (.96) tests.

#### *Organizational performance*

Measurement of organizational performance in healthcare is far from straightforward. Healthcare organizations need to balance multiple (often competing) aims, including immediate health outcomes, quality of life for patients and staff, patient satisfaction, use of resources and financial stability. Many measurements (e.g. health outcomes) are not transferable across different types of healthcare organizations because they deal with patients in different stages of care (e.g. ambulance trusts only see emergency patients at the very start of their care process; primary care trusts deal mainly with long-term and continuing care). In addition, organizations within the NHS are entirely publicly funded, and run on a not-for-profit basis.

However, the Commission for Health Improvement routinely inspects all types of organization. Every 4 years, each organization is subject to a formal inspection, during which it is rated on a series of dimensions that are deliberately constructed to be relevant to all healthcare organization types. A team of five independent experts, including an NHS manager, a doctor, a nurse, an allied health professional and a lay person, participated in rigorous rater training before reading documents from, and spending a week in, each organization. Based on documentation from the organizations, patients and other stakeholders, as well as extensive observation and interviews with



members of staff and patients, the review team rated each organization on seven dimensions with evidence-based criteria. These performance dimensions included: 'Staffing & staff management' (including the recruitment, management and development of staff and the promotion of good working conditions and effective methods of working), 'Education, training and continuing personal and professional development' (covering the support available to enable staff to be competent in doing their jobs, whilst developing their skills and the degree to which staff are up to date with developments in their field), 'Clinical audit' (regular systematic review of procedures against defined clinical standards), 'Risk management' (systems to understand, monitor and minimize the risks to patients and staff and to learn from mistakes), 'Clinical effectiveness' (ensuring that the approaches and treatments used are based on the best available evidence), 'Patient and public involvement' (referring to how patients, carers, service users and the public have a say in decision making about health service delivery, policy and planning) and 'Use of information' (the systems in place to collect and interpret clinical and other information and to use it to monitor, plan and improve the quality of patient care; Healthcare Commission, 2004).

The ratings were made approximately 3 months after the survey data were collected as the culmination of a thorough review process, and were made jointly by all members of the review team upon completion of the review. The rating in each case was a single score on an ordinal scale: 1, 2a, 2b, 2c, 3 or 4. The anchors ranged from 1, 'little or no progress at strategic and planning levels or at operational level' to 4, "excellence - coordinated activity and development across the organization and with partner organizations in the local health economy that is demonstrably leading to improvement." These items were converted to a 6-point scale and found to be internally consistent (Cronbach's  $\alpha = .86$ ). Thus, a measure of 'Organizational Performance' was created as the average rating of each organization across the seven dimensions.

## Results

The scale means, intercorrelations and internal consistency reliabilities are reported in Table 1. The correlation matrix provides support for the direct relationships hypothesized. Consonant with our predictions (H1), work demands was negatively correlated with organizational performance ( $r = -.36, p < .01$ ). Cubic and quadratic terms were also tested, and there was no evidence to suggest that a nonlinear relationship exists between work demands and organizational performance. Similarly, confirming our expectations (H2), climate for innovation was found to be a significant predictor of organizational performance ( $r = .28, p < .01$ ).

An exploratory examination of the relationship between work demands and climate for innovation was also conducted. A small significant, negative, linear relationship was detected ( $r = -.19, p < .05$ ) in bivariate correlation analyses. Nonlinear relationships were also examined, but no evidence was found to support the conclusion that a cubic, quadratic or inverse relationship exists between work demands and climate for innovation.

Hierarchical regression analyses were used to test the hypothesis that climate for innovation can alleviate the negative effects of work demands (H3). Specifically, in the first step of a regression equation, we controlled for trust type (entered as three dummy variables), number of employees and organizational income. Work demands and climate for innovation were entered into the second step of the regression equation (these were standardized before entry). The interaction term (calculated from the standardized

**Table 1.** Scale means, standard deviations and intercorrelations

	<i>M</i>	<i>SD</i>	1	2	3
1. Work demands	0.00	.17	–		
2. Climate for innovation	3.34	.27	–.19*	–	
3. Organizational performance	1.91	.41	–.36**	.28**	–

Note: *N* = 91 organizations, \**p* < .05; \*\**p* < .01.

variables) was entered in the third step of the equations. The results confirm our expectations and show that the interaction of work demands and climate for innovation predicts variance in organizational performance over and above the amount explained by their direct effects ( $\Delta R^2 = .08$ ; see Table 2). Thus, we can conclude that the relationship between work demands and organizational performance is moderated by climate for innovation. The interaction between work demands and climate for innovation was graphed following the procedures outlined by Aiken and West (1991) for the purposes of interpretation (i.e. centred and plotted as a function of regression coefficients; see Figure 1). The graph confirms our expectations and suggests that the relationship between work demands and organizational performance is most negative when climate for innovation is low and least negative when climate for innovation is high.

**Table 2.** Hierarchical regression analyses of organizational performance on work demands and climate for innovation

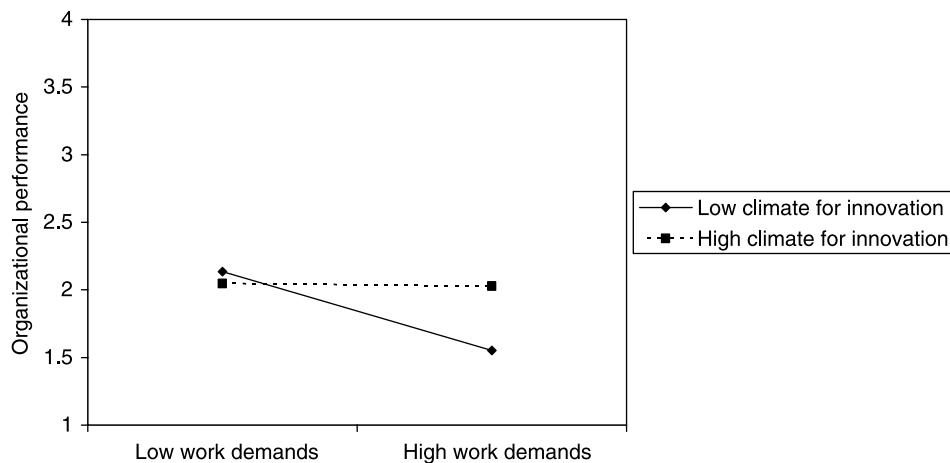
Step	Predictors	$\beta$	Total $R^2$	$\Delta R^2$
1	Type of trust (dummy coded)		.09	
	Number of employees	–.02		
	Organizational income	.05		
2	Work demands	–.19	.23**	.14**
	Climate for innovation	.41*		
3	Work demands x climate for innovation	.30**	.31**	.08**

Note: \**p* < .05; \*\**p* < .01.

## Discussion

Following the job-resource model and extending previous research to the organizational level of analysis, the results of the current study suggest that the average level of demanding work in an organization is linked with negative organizational consequences. Thus, these findings are among the first to highlight potential organizational implications of overworking employees or withholding helpful resources (see also Ganster *et al.*, 2001). The results also indicate that organizational climate for innovation is positively associated with organization performance, bolstering previous evidence in support of the significance of developing such a climate (e.g. West *et al.*, 2005). Furthermore, the current study suggests that organizations may be able to relieve the negative consequences associated with demanding work by maintaining an innovative climate. Each of these findings, their relation to previous research, and practical implications are discussed in detail.

Previous research has generally demonstrated that stressful or demanding work can cause negative consequences for individuals including work behaviours such as



**Figure 1.** The interaction of work demands and climate for innovation in predicting organizational performance.

absenteeism, performance and turnover (see Warr, 1999). However, very little research has extended these findings to consider the average level of demands in an organization. The current study, which includes standard measures of organizational performance from trained, external, second-source raters, provides a conservative and powerful test of the expected negative organizational consequences. Given the present evidence that organizational-level job demands can have a significant impact on organizational performance, researchers and practitioners should continue to examine the emergence of stressors at the organizational level of analysis (see Bliese & Jex, 1999), as well as its causes, consequences and mitigating factors.

Similarly, the revelation of a direct link between climate for innovation and organizational performance also guides future research and practice. Previous research pointed to positive outcomes associated with innovation (e.g. Anacona & Caldwell, 1987; Drazin *et al.*, 1999; Oldham & Cummings, 1996), but very little research has considered climate for innovation as a performance antecedent. Climate researchers should begin to integrate innovation as an important dimension of organizational climate, and practitioners might consider instituting values and norms of innovation within organizational contexts. Managers and top management team who develop innovative climates may produce not only creative products, but also innovative working methods that allow employees to better cope with the demands of their jobs. Furthermore, research into the extent to which actual innovation acts as a mediator or mechanism for the climate–outcome relationship is an important next step.

The results of the current study further imply that in organizational contexts with high work demands, the creation of a climate for innovation may be particularly critical. Following the demands–resource model (Demerouti *et al.*, 2001), climate for innovation appears to be a resource by which individuals who are under demanding work conditions can cope. The innovative climate may give individuals the latitude they need to develop novel methods, processes or schedules that increase their efficiency (see also Bunce & West, 1996). The results of the present study suggest that it is by developing an innovative climate that organizations may be able to support employees who feel overwhelmed by the demands of their work. However, it is important to note the results of exploratory analyses which suggest that the relationship between work demands and

climate for innovation is actually negative. In other words, as organizations demand more from employees, they may be less likely to support innovation. Thus, it may be those organizations that most need to implement innovative changes and are those who find it most difficult. Practitioners should consider the benefits of instituting climates that support innovation within the structures of their organizations; it may be difficult for some organizations (e.g. military, manufacturing) to allow flexibility in work processes. Future research should continue to consider the relationship between these constructs, and especially the creation of innovative climates as a method by which to alleviate the negative consequences of demanding work.

Although the current study has several important strengths, it is not without limitations. One potential limitation is the focus on the health care industry. It may be that the challenges which arise in this context, and the most effective organizational responses, differ from those in other contexts. However, we would argue that the primary constructs of interest (i.e. job demands and climate for innovation) are important across most contexts and the results can be generalized accordingly with appropriate caution (Demerouti *et al.*, 2001). A second limitation is that we were unable to measure actual innovation at the individual or organizational levels. Although our theoretical and practical focus was climate for innovation, future research should consider innovation itself as a potential mechanism by which climate for innovation can help employees cope with demanding work. Measurement of innovation processes, as proximal conditions affecting job demands, may explain the influence of climate. Future research should also examine the extent to which climate for innovation explains incremental variance after controlling for constructs that have been studied previously with regards to job demands (e.g. job control). Third, the assessment of organizational performance provided by trained reviewers may not fully capture all of the variability in organizational performance. A final potential limitation to this study is its cross-sectional design. Since the criterion variable was measured only a few months after the predictors, it is difficult to determine the direction of causality. The relationship between work demands and performance may in fact be reciprocal; as organizations decrease in effectiveness, greater demands may be enforced upon employees. However, these concerns are mitigated by the fact that the theoretical rationale explicitly predicts the hypothesized direction. Furthermore, the use of multiple data sources is strong evidence in support of our conclusions.

Shrinking time horizons, increasing globalization, rapidly shifting technologies and the ever-changing social context of work make investigations of job demands essential. Moreover, in light of evidence suggesting that job stress can cost billions of dollars in productivity, absences and healthcare costs (Xie & Schaubroeck, 2001), researchers and practitioners must consider factors that alleviate the demands of work vital. Taken together, the results of the current study suggest that the creation and maintenance of innovative organizational climates may be an ideal way to address the concerns associated with demanding work. Moreover, the current study suggests that organizational performance may depend on its ability to alleviate these demands.

## References

- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Sage Publications: Newbury Park, CA.
- Anacona, D., & Caldwell, D. (1987). Management issues facing new product teams in high technology companies. In D. Lewin, D. Lipsky, & D. Sokel (Eds.), *Advances in industrial and labor relations* (Vol. 4, pp. 191-221). Greenwich, CT: JAI Press.

- Anderson, N., de Dreu, C. K., & Nijstad, B. A. (2004). The routinization of innovation research: A constructively critical review of the state-of-the-science. *Journal of Organizational Behavior, 25*, 147-173.
- Anderson, N., & West, M. A. (1998). Measuring climate for work group innovation: development and validation of the Team Climate Inventory (TCI). *Journal of Organizational Behavior, 19*, 235-258.
- Amabile, T. M. (1988). A model of creativity and innovation in organizations. In B. M. Staw & L. L. Cummings (Eds.), *Research in organizations* (Vol. 10, pp. 123-167). Greenwich, CT: JAI Press.
- Amabile, T. M. (1996). *Creativity in context*. Boulder, CO: Westview Press, Inc.
- Amabile, T. M., Conti, R., Coon, H., Lazenby, J., & Herron, M. (1996). Assessing the work environment for creativity. *Academy of Management Journal, 39*, 1154-1184.
- Bliese, P. D. (2000). Within-group agreement, non-independence, and reliability: Implications for data aggregation and analysis. In K. J. Klein & S. W. J. Kozlowski (Eds.), *Multilevel theory, research, and methods in organizations*. San Francisco: Jossey Bass.
- Bliese, P. D., & Jex, S. M. (1999). Incorporating multiple levels of analysis into occupational stress research. *Work and Stress, 13*, 1-6.
- Bliese, P. D., & Jex, S. M. (2002). Incorporating a multilevel perspective into occupational stress research: Theoretical, methodological, and practical implications. *Journal of Occupational Health Psychology, 7*, 265-276.
- Bunce, D., & West, M. A. (1996). Stress management and innovation interventions at work. *Human Relations, 49*, 209-222.
- Caplan, R. D. (1971). *Organizational stress and individual strain: A social psychological study of risk factors in coronary heart disease among administrators, engineers and scientists*. Institute of Social Research, University of Michigan, University Microfilms No. 72-14822, Ann Arbor, Michigan.
- Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin, 98*, 310-357.
- Damanpour, F. (1991). Organizational innovation: A meta-analysis of effects of determinants and moderators. *Academy of Management Journal, 14*, 555-590.
- Demerouti, E., Bakker, A. B., Nachreiner, F., & Schaufeli, W. B. (2001). The job demands-resource model of burnout. *Journal of Applied Psychology, 86*, 499-512.
- Drazin, R., Glynn, M. A., & Kazanjian, R. K. (1999). Multilevel theorizing about creativity in organizations: A sensemaking perspective. *Academy of Management Review, 24*, 286-307.
- Ganster, D. C., Fox, M. L., & Dwyer, D. J. (2001). Explaining employees' health care costs: A prospective examination of stressful job demands, personal control, and physiological reactivity. *Journal of Applied Psychology, 86*, 954-964.
- Gonzalez-Roma, V., Peiro, J. M., & Tordera, N. (2002). An examination of the antecedents and moderator influences of climate strength. *Journal of Applied Psychology, 87*, 465-473.
- Gonzalez-Roma, V., & West, M. A. (2004). Agreeing to disagree: Climate strength and innovation in work teams. Unpublished manuscript. University of Valencia.
- Healthcare Commission. (2004). *Manual of clinical governance review/inspection practices*. Retrieved February 16, 2005, from <http://www.healthcarecommission.org.uk/>
- Janssen, O. (2000). Job demands, perceptions of effort-reward fairness, and innovative work behavior. *Journal of Occupational and Organizational Psychology, 73*, 287-302.
- Janssen, O. (2003). Innovative behavior and job involvement at the price of conflict and less satisfactory relations with co-workers. *Journal of Organizational and Occupational Psychology, 76*, 347-364.
- Janssen, O., Van de Vliert, E., & West, M. (2004). The bright and dark sides of individual and group innovation: A special issue introduction. *Journal of Organizational Behavior, 25*, 129-145.

- Jones & James (1979). Psychological climate: Dimensions and relationships of individual and aggregated work environment perceptions. *Organizational Behavior and Human Decision Processes*, 23, 201-250.
- Joyce, W. F., & Slocum, J. W. (1984). Collective climate: Agreement as a basis for defining aggregate climates in organizations. *Academy of Management Journal*, 27, 721-742.
- Karasek, R. (1979). Job demands, job decision latitude, and mental strain: Implications for job redesign. *Administrative Science Quarterly*, 24, 285-306.
- Kaufmann, G. M., & Beehr, T. A. (1986). Interactions between job stressors and social support: Some counterintuitive results. *Journal of Applied Psychology*, 71, 522-526.
- King, E. B., Hebl, M. R., George, J. M., & Matusik, S. F. (2006). Negative consequences of perceived climate for gender inequity. Unpublished manuscript. Rice University.
- Kozlowski, S. W. J., & Klein, K. J. (2000). A multilevel approach to theory and research in organizations: Contextual, temporal, and emergent processes. In K. J. Klein & S. W. J. Kozlowski (Eds.), *Multilevel theory, research, and methods in organizations: Foundations, extensions, and new directions* (pp. 3-90). San Francisco: Jossey-Bass.
- Lazarus, R. S. (1966). *Psychological Stress and the Coping Process*. New York: McGraw-Hill.
- Lindell, M. K., & Brandt, C. J. (2000). Climate quality and climate consensus as mediators of the relationship between organizational antecedents and outcomes. *Journal of Applied Psychology*, 85, 331-348.
- Oldham, G. R., & Cummings, A. (1996). Employee creativity: Personal and contextual factors at work. *Academy of Management Journal*, 39, 607-634.
- Parker, S. K., & Sprigg, C. A. (1999). Minimizing strain and maximizing learning: The role of job demands, job control, and proactive personality. *Journal of Applied Psychology*, 84, 925-939.
- Patterson, M. G., West, M. A., Shackleton, V. J., Dawson, J. F., Lawthom, R., Maitlis, S., Robinson, D. L., & Wallace, A. M. (2005). *Development and validation of an organizational climate measure*. Unpublished manuscript. Aston University.
- Perrewe, P. L., Zellars, K. L., Ferris, G. R., Rossi, A. M., Kacmar, C. J., & Ralston, D. A. (2004). Neutralizing job stressors: Political skill as an antidote to the dysfunctional consequences of role conflict. *Academy of Management Journal*, 47.
- Schaubroeck, J., & Merritt, D. E. (1997). Divergent effects of job control on coping with work stressors: The key role of self-efficacy. *Academy of Management Journal*, 40.
- Schneider, B., Salvaggio, A. N., & Subirats, M. (2001). Climate strength: A new direction for climate research. *Journal of Applied Psychology*, 87, 220-229.
- Thompson, C. A., Beauvais, L. L., & Lyness, K. S. (1999). When work-family benefits are not enough: The influence of work-family culture on benefit utilization, organizational attachment, and work-family conflict. *Journal of Vocational Behavior*, 54, 392-415.
- Warr, P. (1999). Well-being and the workplace. In D. Kahneman, E. Diener, & N. Schwarz (Eds.), *Well-being: The foundations of hedonic psychology*. New York, NY: Russell Sage Foundation.
- West, M. A. (2002). Sparking fountains or stagnant ponds: An integrative model of creativity and innovation implementation in work groups. *Applied Psychology: An International Review*, 51, 355-387.
- West, M. A., & Anderson, N. R. (1996). Innovation in top management teams. *Journal of Applied Psychology*, 81, 680-693.
- West, M. A., Dawson, J. F., Utsch, A., & Borrill, C. (2005a). *Necessity is the moderator of innovation*. Unpublished manuscript. University of Aston.
- West, M. A., & Farr, J. L. (1990). *Innovation and creativity at work: Psychological and organizational strategies*. Chichester, England: Wiley.
- West, M. A., Shackleton, V. J., Hardy, G. E., & Dawson, J. F. (2005b). *Work role characteristics, job security, and individual innovation at work*. Unpublished manuscript. Aston University.
- West, M. A., & Wallace, M. (1991). Innovation in health care teams. *European Journal of Social Psychology*, 21, 303-315.

Xie, J. L., & Schaubroeck, J. (2001). Bridging approaches and findings across diverse disciplines to improve job stress research. In P. L. Perrewe & D. C. Ganster (Eds.), *Research in occupational stress and well being* (Vol. 1, pp. 1-53). Oxford, England: Elsevier Science.

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## **Appendix A**

### ***Work demands scale items***

- I do not have enough time to carry out my work.
- I cannot meet all the conflicting demands made on my time at work.
- I finish work feeling I have not completed everything I should.
- I am asked to do work without adequate staff resources to complete it.
- I am asked to do work without adequate equipment to complete it.
- I cannot follow best practice in the time available.
- I am required to do trivial tasks which prevent me completing more important ones.

## **Appendix B**

### ***Climate for innovation scale items***

- The organization is always moving towards the development of improved patient services.
- People in the organization are always searching for new ways of delivering patient services.
- The organization uses feedback from patients to change services.
- In the organization, we take the time needed to develop new patient services.
- Staff in the organization cooperate in order to help develop and apply new ideas.
- The organization is responsive to patients' views and suggestions.
- The organization actively gathers patients' views on services.
- The organization provides practical support for new ideas and their application.
- The organization has a range of initiatives in place to ensure that patients' views are taken into account.