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Integrating psychosocial safety climate in the JD-R model: A study amongst Malaysian workers

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Orientation: Job characteristics are well accepted as sources of burnout and engagement amongst employees; psychosocial safety climate may precede work conditions.

Research purpose: We expanded the Job Demands and Resources (JD-R) model by proposing psychosocial safety climate (PSC) as a precursor to job demands and job resources. As PSC theoretically influences the working environment, the study hypothesized that PSC has an impact on performance via both health erosion (i.e. burnout) and motivational pathways (i.e. work engagement).

Motivation for the study: So far, integration of PSC in the JD-R model is only tested in a Western context (i.e. Australia). We tested the emerging construct of PSC in Malaysia, an Eastern developing country in the Asian region.

Research design, approach and method: A random population based sample was derived using household maps provided by Department of Statistics, Malaysia; 291 employees (response rate 50.52%) from the State of Selangor, Malaysia participated. Cross-sectional data were analysed using structural equation modelling.

Main findings: We found that PSC was negatively related to job demands and positively related to job resources. Job demands, in turn, predicted burnout (i.e. exhaustion and cynicism), whereas job resources predicted engagement. Both burnout and engagement were associated with performance. Bootstrapping showed significant indirect effects of PSC on burnout via job demands, PSC on performance via burnout and PSC on performance via the resources-engagement pathway.

Practical/managerial implications: Our findings are consistent with previous research that suggests that PSC should be a target to improve working conditions and in turn reduce burnout and improve engagement and productivity.

Contribution/value-add: These findings suggest that JD-R theory may be expanded to include PSC as an antecedent and that the expanded JD-R model is largely valid in an Eastern, developing economy setting.

Introduction

The aim of this research was to examine empirically a theoretical model of psychosocial safety climate (PSC). This emerging construct is defined as the 'policies, practices and procedures for the protection of worker psychological health and safety' (Dollard & Karasek, 2010, p. 208) that are largely influenced by senior management in organisations. We propose an integrative model where PSC is a precursor to work conditions (i.e. job demands and job resources) and in turn burnout, engagement and performance via mediation pathways. In particular, our theory builds on the premises of Job Demands-Resources (JD-R) theory (Bakker & Demerouti, 2007) and we see PSC as precursor for the health and motivation pathways espoused in that model. The research addresses a gap in the literature about the origin of job demands and job resources and in turn the model pathways.

The second aim is to examine the integrative PSC model in an Eastern culture and in an emerging economy to determine whether the assumptions of the model are emic (specific) or etic (general). So far, the JD-R model (Bakker, Demerouti, & Verbeke, 2004) and the PSC integrative model (Dollard & Bakker, 2010) have mainly been tested in Western nations. Research on psychosocial factors and work stress in Eastern countries such as Malaysia is lacking (Sadhra, Beach, Aw, & Sheikh-Ahmed, 2001), as it is in most developing countries (Chopra, 2009). Moreover, work and organisational (psychology) research is less advanced in Eastern countries (Burke, 2010). In short, knowledge development in the area is lacking precisely where it may be needed most (Kortum, Leka & Cox, 2008).

Psychosocial safety climate

Psychosocial safety climate theory brings together insights from the work stress and safety science literatures. Although numerous work stress studies have identified a range of important psychosocial aspects, none has specifically identified a psychosocial safety climate. Further, two disparate lines of research separately explain workplace physical and psychological health (Dollard & Bakker, 2010). The first, safety climate research, examines safety behaviours and perceptions and their influences on employees' physical health (Flin, Mearns, O'Connor, & Bryden, 2000; Zohar & Luria, 2005). The second focuses mainly on work conditions, job demands and resources, worker psychological health and motivational related outcomes.

Psychosocial safety climate is largely an indicator of the true priorities of an organisation towards competing climate interests, for example, a climate for productivity vs. a climate for psychological health. According to leading theorists in the safety climate literature, the best way to make sense of an organisation's true priorities is via perceptions of enacted policies, practices and procedures (Zohar & Luria, 2005). Other perceptual or sense-making cues may be derived from the divergence or convergence between what management *say* and what they *do* in relation to these operational aspects. These perceptions in aggregate provide a measure of climate, because PSC is argued to be a property of the organisation, team, or unit. Knowing about the climate will provide a good indication of the working conditions (i.e. job demands and job resources), worker psychological health, engagement and productivity of employees.

Psychosocial safety climate is characterised by:

1. management commitment
2. management priority
3. management and employee participation and involvement in stress prevention
4. organisational communication.

Evidence from the work stress literature highlights these factors as important components of successful organisational stress intervention projects (European Agency for Safety and Health at Work, 2002; Jordan, Gurr, Tinline, Giga, Faragher & Cooper, 2003; Kompier & Kristensen, 2001). Evidence of these characteristics within organisations indicates varying levels of PSC, which will predict the kind of work environment experienced and the psychological reactions to these characteristics. Not unsurprisingly, these characteristics converge with factors identified in safety science research that typify a strong safety climate (Cox & Cheyne, 2000).

In consideration of the characteristics of PSC, an organisation which strongly emphasises employee psychological health and safety will create job demands that are both motivating and conducive to health (Dollard & Bakker, 2010). Communication systems will be in place so that risks can be *prevented*, identified and managed, for example, through

better allocation of workload or greater opportunity for recovery. There will be strong participation and involvement of all levels of the organisation in stress prevention. This will lead to better information for continuous improvement and will render jobs less stressful. Managers who have little regard, priority, or commitment for worker well-being (as in a low PSC environment) will ignore high demand scenarios and will not supply adequate resources. If PSC is an antecedent to working conditions, then conceivably it will lead to better health and work performance via these conditions.

Psychosocial safety climate as the other construct, not another construct

Despite a plethora of organisational climate constructs (for a review, see Kuenzi & Schminke, 2009), none appear to relate specifically to psychological health and safety (freedom from psychological harm) climate. The PSC construct shares some similarities with other safety climate constructs (Zohar, 1980) and team psychological safety (Edmondson, 1999) but is also different. PSC is an antecedent to working conditions that relate to psychological health and safety. The concept of PSC is derived in part from the notion that external factors affect how working conditions are created (see Sauter & Murphy, 2003); how senior management within the organisations reacts to such external forces determines PSC (Dollard & Karasek, 2010). For instance, the pressure of external competition may lead senior management to introduce lean production systems that are detrimental to workers' health. By using this principle, we believe that working conditions (i.e. job demands and resources) derive from initiatives of senior managers as discussed in the previous section.

It might be argued that PSC is related to psychological safety as defined by Edmondson (1999). Psychological safety is related to employees being safe and able to speak out without being rejected or punished (Baer & Frese, 2003); in turn employees' perception should enhance their work performance (Baer & Frese, 2003), or team learning behaviour (Edmondson, 1999). We expect that in high PSC climates, psychological safety will be an outcome. High PSC environments would also lead to greater safety in the form of freedom from more serious psychological injury that could arise from psychologically damaging actions of others, including bullying (see Bond, Tuckey, & Dollard, 2010).

Most climate studies have focussed on climate as an outcome variable, or as a mediator variable of working conditions. One unique aspect that distinguishes PSC from other climates (e.g. safety climate) is the fact that PSC is viewed as a precursor or antecedent variable to working conditions and not as an outcome or mediator. Empirically, recent studies demonstrate that PSC is clearly an antecedent to the work context and is associated with psychological health through its relationship with the working environment (Bond *et al.*, 2010; Dollard & Bakker, 2010). These studies show that PSC is a valid and reliable construct in relation to work conditions, psychological health and work engagement.

Extended JD-R theory

The Job Demand-Resources (JD-R) model (Bakker & Demerouti, 2007) is a parsimonious heuristic model that synthesises a number of important health and performance related constructs. So far, the JD-R model has received much attention from scholars and has been tested in various countries, mainly in Western nations (Bakker, Demerouti, & Verbeke, 2004). PSC reflects management priorities, for example, where job resources will be allocated and what the workload will be; consequently, PSC will be associated with working conditions. In this paper, we explain how PSC triggers the key operational paths described in JD-R theory via its effect on job entities. A central assumption of the JD-R model is that every occupation has its own specific characteristics, described in terms of *job demands* and *job resources*.

Job demands refer to any aspect of the job that requires people to expend physical, cognitive and emotional effort (Bakker & Demerouti, 2007). In other words, they refer to 'things that have to be done' (Schaufeli & Bakker, 2004, p. 296). Job resources (e.g. job control and supervisory support), energise workers towards work goals and stimulate personal growth (Demerouti *et al.*, 2001) and can minimise the impact of job demands on employees' well-being (Bakker, Demerouti, & Euwema, 2005).

The JD-R model postulates that job demands and job resources trigger two kinds of psychological processes namely, *health impairment* and *motivational* processes (Schaufeli & Bakker, 2004). Job demands may require sustained physical and/or psychological effort, hence, are associated with certain physiological or psychological costs (Bakker *et al.*, 2004). High demands without the opportunity for recovery will lead to overtaxing, resulting in exhaustion and health impairment. Job resources, by contrast, play either an intrinsic (e.g. fulfill human needs) or extrinsic motivational role (e.g. fulfill work goals) (Bakker & Demerouti, 2007) therefore will energise employee motivation (e.g. engagement) and lead to increased performance (Bakker *et al.*, 2007). In general, whilst job resources refer to any aspects of a job that facilitate work goals and reduce demands job resources also play a motivational role (intrinsic and extrinsic) for employees (Bakker & Demerouti, 2007).

Theoretically, the way PSC functions can be understood by augmenting the JD-R model. Firstly, we expect that in high PSC environments managers will be cognisant of the negative impact of chronic job demands and will have in place policies, practices and procedures to ensure that workers are not unduly exposed to stress inducing work conditions. We expect that PSC is negatively related to job demands (Hypothesis 1, see Figure 1 with hypotheses identified).

There is some empirical evidence for this. Dollard and Bakker (2010) found that organisational-level PSC predicted change in emotional demands and work pressure over time in education workers. Bond, Tuckey and Dollard (2010) also

found that PSC was associated with bullying both cross-sectionally and longitudinally amongst police officers. In the present study, we investigated emotional demands and role conflict. Role conflict may be a particularly important predictor of burnout in Malaysia as suggested by recent research in nurses (Yunus, Mahajar, & Yahya, 2009) and in a Malaysian-based multinational company (Jamal, 2008). We investigate emotional demands on the basis that in Western studies there is strong evidence of the importance of emotional demands as a key stressor (Bakker, Demerouti & Schaufeli, 2003; Kristensen, 2002), however, there is scant research on this in Malaysia.

Next, turning to the assumptions of the JD-R model, job demands are positively related to burnout (Hypothesis 2). There is very strong empirical evidence for this strain process and dozens of studies convincingly show that job demands are positively related to burnout (Korunka, Kubicek, Schaufeli, & Hoonakker, 2009; see Schaufeli, Bakker & Van Rhenen, 2009 for a review).

Theoretically, burnout is negatively related to performance in JD-R theory as well (Hypothesis 3). There is empirical evidence for a negative relationship between burnout and (objective) performance (Bakker *et al.*, 2008; Demerouti, Verbeke, & Bakker, 2005). Following Hockey's (1997) assumption regarding the passive coping mode, we assume that people who are trapped in negative affective-cognitive states (including burnout) are likely to reduce their work accuracy and effort as a mechanism to cope. In extreme cases, people may not pursue their tasks at all (Schaufeli & Bakker, 2004). In sum burnout may be related to reduced performance through an erosion of personal energy (Schaufeli & Bakker, 2004) and less striving for achievement (Halbesleben & Bowler, 2009).

Bringing these three hypotheses together, we propose (see Figure 1) that PSC is a trigger to the health erosion pathway of the JD-R model. Specifically, PSC is positively related to performance first through job demands and then through burnout (Hypothesis 4).

The motivational process of the JD-R model is driven by the availability of resources (Schaufeli *et al.*, 2009). We argue that in high PSC environments, managers will ensure

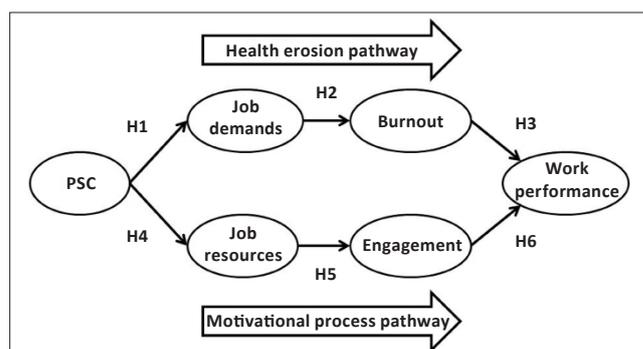


FIGURE 1: Study model - PSC as precursor to job demands and job resources and its relationship to work performance through burnout and engagement.

that adequate job resources are available for employees; in other words, PSC is positively related to job resources (Hypothesis 5). Therefore, managers will understand through good communication and feedback systems with employees, what job resources are required to help employees achieve both personal and work related goals. If management is concerned about employees' psychological health and safety, this will lead to a better working environment via a supply of various job resources (e.g. decision authority, supervisory support).

Whilst decision authority will give employees a lot of choice, such as more control over their tasks (Bakker *et al.*, 2005), supervisory support will help them to cope better with their job demands (Bakker *et al.*, 2005). Consequently, this will enable employees to remain engaged with their work. Social exchange theory is relevant here as well: employees supplied with adequate job resources, will react with more effort toward the organisation (Blau, 1964), with more organisational commitment (Hakanen, Bakker, & Schaufeli, 2006) and personal initiative (Hakanen, Perhoniemi, & Toppinen-Tanner, 2008).

There is some indication that job resources such as job control and support are an issue in Malaysian work environments. For example, low decision authority is a source of job dissatisfaction in Malaysian academics (Huda, Rusli, Naing, Tengku, Winn & Rampal, 2004) and lack of supervisor support is associated with depression and stress (Edimansyah, Rusli, Naing, Rusli, Winn, & Ariff, 2008).

Turning again to the JD-R model, the next proposition is that job resources will be positively related to work engagement (Hypothesis 6). Again there is a large body of evidence to support this claim (Bakker & Leiter, 2010; Hakanen, Schaufeli, & Aloha, 2008; Schaufeli & Bakker, 2004; Schaufeli *et al.*, 2009) and job resources relate to employee engagement more strongly than job demands. However, neither of the two Malaysian studies examined the relationship between job resources and work engagement.

Finally, we expect that work engagement will be positively related to performance (Hypothesis 7). Although there is currently a lack of studies that examine the link between engagement and work performance (Bakker & Demerouti, 2008) there are several reasons why engaged workers should perform better than non-engaged workers (Bakker, 2009). Engaged workers often experience positive emotions such as happiness and enthusiasm. According to the broaden-and-build theory (Fredrickson & Branigan, 2005), positive emotions broaden one's focus and attention to a more expansive set of stimuli in the environment; when attention is broad the individual can develop and build personal skills and resources. For example, joy may encourage the exploration of novel situations and the development of new skills in problem solving. Secondly, engagement is related to health and this implies that workers are *able* to perform better. Finally, engagement may be closely related to positive work performance because of the focus and energy engaged worker bring to the task (Schaufeli & Bakker, 2004).

A recent meta-analysis that operationalised work engagement in terms of satisfaction with motivating resources, found that work engagement related positively to a range of business-unit performance outcomes (i.e. customer satisfaction, profitability, productivity, employee turnover and accidents) (Harter, Schmidt, & Hayes, 2002). The JD-R model disaggregates this relationship by defining work engagement separately from job resources and positive work outcomes (Bakker & Leiter, 2010; Bakker & Schaufeli, 2008). In consideration of this and bringing the motivational propositions together, we postulate that PSC triggers the motivation pathway; PSC is positively related to performance firstly through job resources and secondly through work engagement (Hypothesis 8).

Research design

Research approach

Recent studies of job stress in Malaysia show that employees experience stress, depression and anxiety symptoms due to high job demands (Rusli, Edimansyah, & Naing, 2008). They also report workers being trapped in jobs with high psychological demands and low job security (Edimansyah *et al.*, 2008). There is evidence of increased job insecurity in recent times with more than 100 000 local employees terminated from their jobs between 2002 and 2006 (Malaysian Trades Union Congress Bulletin, 2007). In insecure work contexts, employees are likely to endure work stressors. Neither the PSC nor the JD-R model has been tested in Malaysia, an Eastern developing economy and one of the most successful economies in South East Asia.

This study is a part of our project on psychosocial risk factors in Malaysia; the study furthermore trials a psychosocial surveillance tool within one state of Malaysia, namely Selangor. The sampling technique like most surveillance systems (71%) is random sampling from the working population (Dollard, Skinner, Tuckey, & Bailey, 2007). Ideally, climate studies focus on shared perceptions of climate and aggregate individual data to the organisational or unit level. However, according to data presented in a recent meta-analysis by Clarke (2006), only 17% of safety climate studies actually appear to do this. Population sampling poses a challenge when assessing climate phenomena as aggregation at the organisational level is not possible. Nevertheless, it is important to note that our study theorises and considers PSC as a property of the organisation. Despite this drawback, the population sample enables us to test the theories across many organisations, occupations and sectors to determine their general veracity.

Research method

Participants and procedure

We used a population-based sample in the present study. We used a household map provided by the Department of Statistics in Malaysia that provides a stratified random sample of houses representative of the wide socio-economic variations by location in the state of Selangor. This method

is similar to that used in a study of job security in Taiwan (Chang & Lu, 2007). A questionnaire was distributed to every household and was collected three days after its distribution. Our sampling strategy required only one working adult participant from each household. We approached 576 employees and a total of 291 employees agreed to participate (response rate is 50.52%). The study was approved by University of South Australia Human Research Ethics Committee.

The proportion of males to females was 53% males and 47% females, with 87.9% of participants aged between 20 and 49 years old. In total, 47.4% of respondents had a secondary school education and 58.1% lived in urban areas. The respondents were mainly Malay (68.7%), 24.1% were Indian, 3.8% were Chinese and the rest consisted of other ethnic groups.

Measurement instruments

Most of the instruments used in this study were translated using back-to-back translation, unless otherwise indicated.

Psychosocial safety climate: This was assessed using the PSC-12, a twelve item scale derived from Dollard and Kang's (2007) original 26-item version (Hall, Dollard, & Coward, 2010). The questionnaire measures four sub-dimensions of PSC each with three items. The response scale ranges from 1 (*strongly disagree*) to 5 (*strongly agree*); example on questions in each subscale:

- 'In my workplace senior management acts quickly to correct problems/issues that affect employees' psychological health' (*management commitment*; $\alpha = 0.86$).
- 'There is good communication here about psychological safety issues which affect me' (*organisational communication*; $\alpha = 0.67$).
- 'Senior management clearly considers the psychological health of employees to be of great importance' (*management priority*; $\alpha = 0.80$).
- 'Participation and consultation in occupational health and safety issues occurred with employees, unions, and occupational health and safety representatives' (*organisational participation*, $\alpha = 0.77$).

These dimensions are inter-related and considered as underlying indicators of the latent construct PSC and are used as such in the SEM analysis.

Job demand: These were assessed using *emotional demands* (three items) and *role conflict* (four items), from the Copenhagen Psychosocial Questionnaire (COPSOQ; Kristensen, Hannerz, Hogh, & Borg, 2005). Answers were on a 5-point scale: 0 (*strongly disagree*) to 4 (*strongly agree*). A sample question for emotional demands comprises 'Does your work put you in emotionally disturbing situations?' A sample question regarding work role conflict is 'Do you do things at work that are accepted by some people but not by others?' The reliability of the scales is $\alpha = 0.82$ and 0.82 , respectively.

Job resources: We examined job resources by using two subscales: *supervisor support* and *decision authority* from the Job Content Questionnaire (JCQ) (Karasek *et al.*, 1998). *Supervisor support* was assessed using five items including; 'My supervisor/manager is concerned about the welfare of those under him/her' ($\alpha = 0.85$). The response formats used four points: 1 (*strongly disagree*) and 4 (*strongly agree*). However, this scale also includes an additional point, 5 (I have no supervisor) for those people where supervision is not applicable. As there were only 2.8% of non-applicable responses, we treated these as missing values. *Decision authority* was assessed using two of the original three items, for example, 'My job allows me to make a lot of decisions on my own' ($\alpha = 0.63$). Response formats to both scales used four points: 1 (*strongly disagree*) and 4 (*strongly agree*). We omitted a reversed item due to low reliability. Both of these scales are from the Malay version of the JCQ (Edimansyah *et al.*, 2008).

Burnout: This was examined using two sub-scales of the Maslach Burnout Inventory-General Survey (MBI-GS; Schaufeli, Leiter, Maslach, & Jackson, 1996). For *emotional exhaustion*, we used five items, for example, 'I feel emotionally drained from my work'. For *cynicism*, we used four of the original five items. Consistent with Bakker *et al.* (2008) and Schutte, Toppinnen, Kalimo and Schaufeli (2000), we omitted one item, 'I just want to do my job and not be bothered' due to low reliability. An example item is: 'I doubt the significance of my work'. Responses were scored on a 7-point scale: 0 (*never*) to 6 (*always*) ($\alpha = 0.83$ and 0.67 , respectively).

Work engagement: We used the *vigor* and *dedication* subscales derived from a shortened version of the Utrecht Work Engagement Scale (UWES; Schaufeli, Bakker, & Salanova, 2006) to measure work engagement. Each subscale was examined with three items and a seven point scale from 0 (*never*) to 6 (*always*). Two sample questions include ($\alpha = 0.86$ and 0.83 respectively):

- 'At my work, I feel bursting with energy' (*vigor*)
- 'I am enthusiastic about my job' (*dedication*).

Performance: This was assessed using two questions from the World Health Organization Work Performance Questionnaire (HPQ; Kessler *et al.*, 2003). The self-report HPQ has been validated by comparing it with objective organisational performance amongst 3200 employees from four organisations (airline reservation agents, customer services, automobile company executives and railroad engineers). Good concordance was found between measures in all groups. The questions included in the present study were:

- 'Using the 0 (*the worst job performance*) to 10 (*top performance*) scale, how would you rate your usual job performance over the past year or two?'
- 'Using the 0 (*the worst performance*) to 10 (*top performance*) scale, how would you rate your overall job performance on the days you worked during the past 4 weeks (28 days)?'

The reliability for this short scale is acceptable ($\alpha = 0.83$); inter-item correlation for the two items is 0.71.

Statistical analysis

Firstly, we conducted a descriptive analysis to examine inter-correlations between all variables (see Table 1). Secondly, as we conducted a cross sectional study, we used Harman's one factor test to determine whether common-method variance is a serious problem (Podsakoff & Organ, 1986). An unrotated factor analysis of all study items yielded 11 factors in total explaining 60% of the variance. Given that a single factor did not appear and that a general factor did not account for most of the variance, common method bias is not viewed as a significant threat in our study (Podsakoff & Organ, 1986). Moreover the factors were generally the same as those used as indicators in Figure 2.

Thirdly, we tested a variety of models with structural equation modeling using AMOS version 17 (Arbuckle, 2003) and tested the progressive fit of models using the chi-square difference test. We evaluated our model by using five absolute fit indices (cf. Joreskog & Sorbom, 1986): the chi-square statistic (χ^2), goodness-of-fit index (GFI), comparative fit index (CFI), Tucker-Lewis index (TLI) and the root mean square error of approximation (RMSEA). For GFI, CFI and TLI, values greater than 0.90 are acceptable whereas for the RMSEA a value equal to or smaller than 0.08 is acceptable (Byrne, 2001).

We first assessed the null hypothesis model (M0). Then we tested the proposed full mediation model (M1) as shown in Figure 1. Note that in the research model, we allowed the structural residuals (i.e. measurement errors) of job demands and job resources and also burnout and engagement to covary. We then tested a partial mediation model (M2) with the following paths:

PSC → *job demands* → *burnout* → *performance*, *PSC* → *job resources* → *engagement* → *performance*, with *PSC* to all model variables, *PSC* → *burnout*, *PSC* → *engagement* and *PSC* → *performance*.

Further, we tested an alternative model that only included direct effects of PSC to more distal mediators and the dependent variable (M3), with the following paths:

PSC → *burnout*; *PSC* → *engagement*
PSC → *performance*.

Hypotheses were assessed against results in the final accepted model (M4). One-tailed significance levels are reported given that the hypotheses were directional.

Results

Descriptive statistics

Means, standard deviations and correlations between all variables are shown in Table 1.

Fit indices and comparisons of alternative models are shown in Table 2. Starting with the initial null hypothesis model (M0), the fit of the model was poor as expected. We then tested the mediation model (M1) with the paths:

PSC → *job demands* → *burnout* → *performance*, *PSC* → *job resources* → *engagement* → *performance*.

The proposed mediation model fit the data adequately (GFI = 0.94; CFI = 0.94; TLI = 0.93; RMSEA = 0.06). Against the M0 model, the M1 model showed a significant improvement with $\Delta\chi^2$ significant at $p < 0.001$ (see Table 2).

We then tested a partial mediation model (M2) with paths between:

PSC → *job demands* → *burnout* → *performance*, *PSC* → *job resources* → *engagement* → *performance*

and a path from PSC to all model variables,

PSC → *burnout*, *PSC* → *engagement* and *PSC* → *performance*

We found that this model fit the data well with all fit indices showing reasonable values: GFI = 0.94; CFI = 0.95; TLI = 0.93 and RMSEA = 0.06. When contrasted to the previous proposed mediation model (M1), we found that the model showed an improvement and $\Delta\chi^2$ was significant at $p < 0.01$. All other fit indices were similar to the M1 model. Additional significant paths that accounted for the improved model and could be reasonably theoretically defended were:

TABLE 1: Means (*M*), standard deviations (*SD*) and correlation between the study variables.

Variables	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11	12
1. PSC – Commitment	3.48	0.81	1.00	-	-	-	-	-	-	-	-	-	-	-
2. PSC – Priority	3.48	0.76	0.69**	1.00	-	-	-	-	-	-	-	-	-	-
3. PSC – Communication	3.35	0.67	0.56**	0.64**	1.00	-	-	-	-	-	-	-	-	-
4. PSC – Participation	3.55	0.74	0.53**	0.70**	0.64**	1.00	-	-	-	-	-	-	-	-
5. Emotional demands	1.40	0.80	-0.13*	-0.17**	-0.05	-0.17**	1.00	-	-	-	-	-	-	-
6. Role conflict	1.48	0.73	-0.10	-0.05	-0.02	-0.06	0.51**	1.00	-	-	-	-	-	-
7. Decision authority	2.78	0.54	0.05	-0.01	0.14*	0.05	0.11	-0.02	1.00	-	-	-	-	-
8. Supervisor support	3.20	0.61	0.26**	0.30**	0.26**	0.19**	-0.14*	-0.08	0.13*	1.00	-	-	-	-
9. Exhaustion	2.94	1.23	-0.10	-0.16**	-0.04	-0.14*	0.23**	0.22**	0.13*	-0.04	1.00	-	-	-
10. Cynicism	2.43	1.12	-0.17**	-0.17**	0.06	-0.20**	0.35**	0.37**	-0.01	-0.01	0.43**	1.00	-	-
11. Vigor	4.33	1.28	0.18**	0.27**	0.21**	0.30**	-0.11	-0.01	0.12*	0.23**	-0.05	-0.01	1.00	-
12. Dedication	4.33	1.20	0.23**	0.32**	0.35**	0.40**	-0.14*	-0.12*	0.14*	0.26**	-0.10	-0.04	0.80**	1.00
13. Productivity	6.85	1.62	0.20**	0.30**	0.13*	0.27**	-0.23**	-0.07	0.04	0.24**	-0.06	-0.13*	0.32**	0.36**

M, Means; *SD*, standard deviations.

N = 291 employees.

*, $p < 0.05$; **, $p < 0.01$

PSC → burnout ($\beta = -0.15; p < .05$) and PSC → performance ($\beta = 0.17; p < 0.05$).

Theoretically, low PSC may be experienced as stressful in line with psychological safety theory, because they are a threat to the self (Semmer, McGrath, & Beehr, 2005). High PSC may result in a direct boost to performance that could be explained through social exchange theory but via factors other than the demands and resources specified in the model, or by psychological states other than engagement (e.g. commitment) and burnout.

Next, we tested an alternative direct effects model (M3) with only the following paths:

$PSC \rightarrow burnout; PSC \rightarrow engagement$
 $PSC \rightarrow performance.$

We found that M3 was not as good a fit with GFI = 0.89; CFI = 0.86; TLI = 0.83 and RMSEA = 0.10. Nevertheless, results here showed that PSC was related to performance ($\beta = 0.34, p < 0.001$); in other words, this provides some evidence that there is a direct effect to be mediated.

Our final model (M4), as illustrated in Figure 2, indicated that the best fitting model was:

$PSC \rightarrow job\ demands \rightarrow burnout \rightarrow performance$
 $PSC \rightarrow job\ resources \rightarrow engagement \rightarrow performance$

with additional paths PSC → burnout and PSC → performance (M1 plus the two additional direct paths).

As shown in Table 2, adding these additional paths led to a significant improvement in M1 with GFI = 0.94, CFI = 0.95, TLI = 0.94, RMSEA = 0.06; $\Delta\chi^2$ was significant at $p < 0.01$. Moreover, it is important to note the sizeable standardised loadings of each PSC dimension on the latent PSC measure:

- commitment; 0.78
- priority; 0.88

- communication; 0.74
- participation; 0.77.

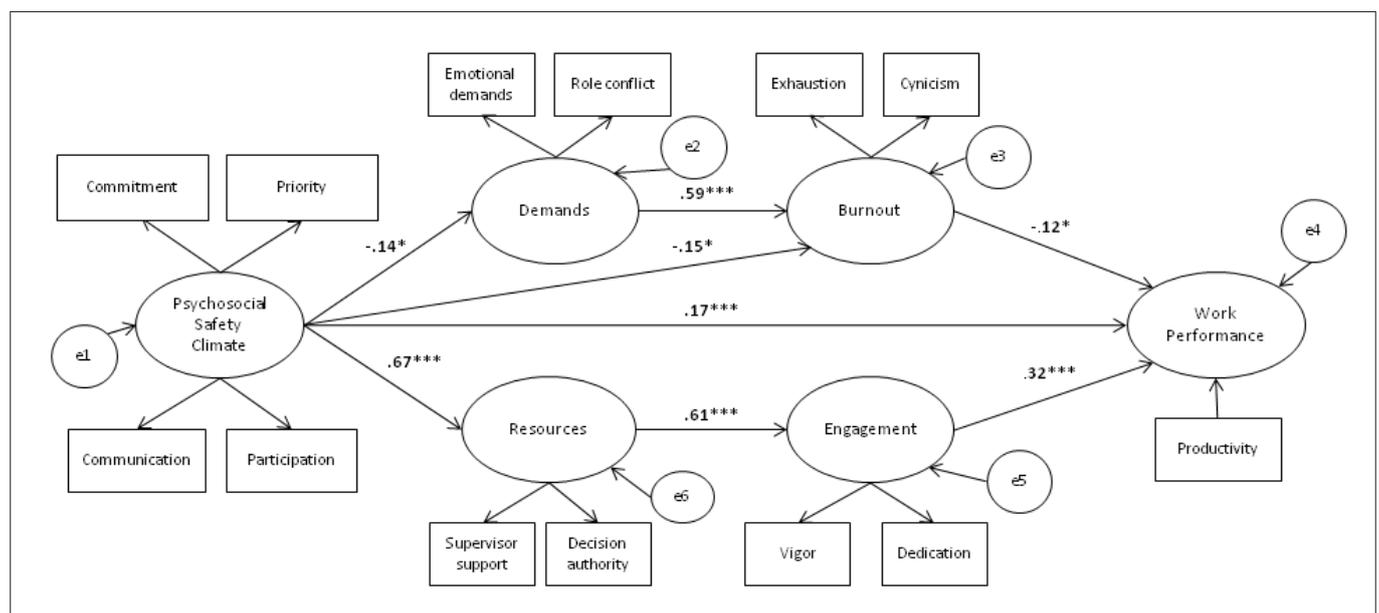
Our findings supported *Hypothesis 1* that PSC is negatively related to job demands (emotional demands and work conflict); with $\beta = -0.14, p < 0.05$. Our finding also supported *Hypothesis 2* that job demands are positively related to burnout (i.e. emotional exhaustion and cynicism) with $\beta = 0.59, p < 0.001$. Our analysis also revealed that burnout is negatively related to performance (*Hypothesis 3*), $\beta = -0.12, p < 0.05$ confirming the significant negative relationship between burnout and performance.

To test whether PSC is a trigger to the health erosion pathway of the JD-R model (*Hypothesis 4*), such that

- job demands carries the indirect effect of PSC on burnout and
- burnout carries the indirect effect of job demands onto work performance

We utilised a bootstrapping method using AMOS software. Although the Sobel test is often used to test the mediation process, tests that are more direct are suggested. In particular, because the product of the effects of the paths comprising the indirect effect is non-normal, bootstrapping is recommended (Hayes, 2009; Preacher, Rucker, & Hayes, 2007). Bootstrap samples were derived by repeatedly estimating the coefficients with a minimum of 1000 bootstrap samples, each of which comprises N cases randomly sampled with replacement from the original sample ($N = 291$). Convention suggests the effect is significant if the 95% confidence intervals (CI) denoted by lower and upper bounds excludes the value of 0.

Our 1000 samples bootstrapping analysis indicated that the indirect effect of PSC on burnout via job demands was significant (indirect effect is = -0.09, 95% lower bootstrap CI = -0.233, upper CI, -0.005, $p < 0.05$). However, the



Note: $N = 291$.

*, $p < 0.05$; **, $p < 0.01$; ***, $p < 0.001$

FIGURE 2: PSC as a precursor to job demands and resources, and its impact on performance through burnout and engagement.

indirect effect of job demands on performance via burnout was not supported (indirect effect = -0.053, 95% lower CI = -0.544, upper CI = 0.65; *n.s.*). The indirect effect of PSC on performance via burnout was significant, (indirect effect is = 0.81, 95% lower bootstrap CI = 0.47, upper CI, 1.26, $p < 0.01$). Thus, Hypothesis 4 is partially supported; PSC triggers the health erosion reaction via job demands to burnout, but not to performance. However, the effect of PSC on performance was additionally carried by burnout.

In *Hypothesis 5*, we predicted that PSC is positively related to job resources and this was confirmed with a significant relationship ($\beta = 0.67$, $p < 0.001$). *Hypothesis 6* that job resources are positively related to work engagement was also supported ($\beta = 0.61$, $p < 0.001$). *Hypothesis 7* proposed that work engagement will be positively related to performance and this was confirmed in our study ($\beta = 0.32$, $p < 0.001$).

Again, we used a direct test of the mediation motivation pathway as indicated in *Hypothesis 8*. Bootstrapping results showed that the indirect path between PSC and engagement was influenced by job resources (indirect effect = 0.938, 95% lower CI = 0.06, upper CI, 9.00, $p < 0.01$). Additionally, our analysis showed that engagement carried the effect of job resources on work performance (indirect effect = 1.030, 95% lower CI = 0.50, upper CI = 2.81, $p < 0.05$). Together, our finding suggests that when PSC is high, higher levels of job resources are supplied to fulfill employees' needs and this increases employees' engagement. In turn, engagement carries the effect of resources on performance.

Discussion

We argued for an integrative model where PSC theoretically influences working conditions and influences work performance via the health erosion (burnout) and motivational (engagement) pathways espoused in the JD-R model. We tested the integrative model and, by implication, the JD-R model in a non-Western culture (i.e. Malaysia), to see whether the basic arguments derived from Western thinking are applicable in a different work context. Recently, Burke (2010) commented on how difficult it was to obtain details about workplace stress and engagement outside the Western context, due to a limited organisational research tradition in those areas. Whilst most psychological theories are developed in the Western tradition, we argued for the need to investigate how well the theories apply in other countries and cultures. Moreover, we tested the veracity

of the extended JD-R model in a population-based sample: previous research integrating PSC in the JD-R model is restricted to single organisations or occupations.

We found support for the expanded health erosion pathway, that PSC has a negative relationship with burnout through job demands. Consistent with previous Western findings, we confirmed that role conflict and emotional demands contribute to burnout (e.g. Bakker *et al.*, 2005; Bakker & Demerouti, 2007; Schaufeli & Bakker, 2004). Further, we found that in high PSC organisations, lower levels of job demands (i.e. emotional demands and role conflict) were evident. Although the concept of PSC and demands are grounded in the Western context, our Eastern findings are similar to those reported in the Western studies (Bond *et al.*, 2010; Dollard & Bakker, 2010). In general, the findings are consistent with our argument that working conditions are designed and created by managers (Morgeson & Humprey, 2008). Against expectations, we did not find that burnout carried the effects of job demands on performance.

Instead, we found that PSC was related to performance via burnout. Although we proposed that the negative direct effect of PSC to burnout may be plausible as an 'offence to self' stressor (Semmer *et al.*, 2005), the direct effect may also be explained by other demands not assessed in this study.

In the present study, we also predicted that PSC would enhance performance through its positive relationship with job resources and engagement. We found full support for this expanded motivation hypothesis. Managers who are concerned about employee psychological health, provide enough job resources for their employees (i.e. supervisor support, decision authority) which boosts employee engagement and in turn work performance.

Although we proposed a fully mediated model, we did find significant direct effects between PSC and burnout and between PSC and performance as well. These relationships may indicate that additional job demands and job resources are at play in the mediated paths that were not measured in the study. Alternatively, it could indicate substantive direct effects. This needs to be explored in future research. Despite the finding of partially rather than fully mediated pathways the results support the major claim of PSC theory that PSC precedes work conditions.

The theoretical implications of our research are in general that the integrative PSC model is applicable in an Eastern,

TABLE 2: Fit indices and comparisons of alternative models for integrating psychosocial safety climate (PSC) in the JD-R Model.

Models	Type	χ^2	<i>df</i>	GFI	CFI	TLI	RMSEA	AIC	$\Delta\chi^2$ (<i>df</i>) sig	Comparison
Null model	M0.	1343.54	78	0.94	0.00	0.00	0.24	1370.86	-	-
Proposed mediation model	M1.	127.01	59	0.94	0.94	0.93	0.06	191.01	1216.53(19)***	M1-M0
Partial mediation model	M2.	116.78	56	0.94	0.95	0.93	0.06	186.78	10.23(3)**	M2-M1
Alternative direct effects model	M3.	238.63	63	0.88	0.84	0.80	0.11	322.30	111.62(4)***	M3-M1
Final model	M4.	116.80	57	0.94	0.95	0.93	0.06	184.81	10.21(2)**	M4-M1

χ^2 , chi-square; *df*, degrees of freedom; GFI, Goodness of Fit Index; CFI, Comparative Fit Index; TLI, Tucker-Lewis Index; RMSEA, Root Mean Square Error of Approximation; AIC, Akaike Information Criterion.

*, $p < 0.05$; **, $p < 0.01$; ***, $p < 0.001$

developing economy. In other words, the integrative model has etic qualities. Taken together, the evidence points towards the benefit of expanding the JD-R model to include PSC as a trigger to the main pathways of the model. Importantly, the evidence supports the proposition that PSC is a source of job demands and job resources and helps to answer the question, 'from where do job demands and resources arise?' When managers in organisations prioritise psychological health over productivity concerns we expect working conditions to be designed to be conducive to both health and work engagement (Dollard & Karasek, 2010).

In short, even though we were unable to discover relevant previous theory driven research from Malaysia to describe the psychological health and engagement in the workplace, our hypothesised model is largely applicable in an Eastern, collective, developing economy context.

Practical implications

Our findings are consistent with previous research that confirms that PSC could be a target to improve job resources and engagement (Dollard & Bakker, 2010). Indirectly and directly, high PSC contexts (high commitment from management, priority, communication and participation for worker psychological health and safety) should lead to increased performance. Although the impact of job stress on employee well-being and performance is well acknowledged (Bakker *et al.*, 2008; Demerouti *et al.*, 2005) we see that measurement of PSC could provide a useful tool to assist in the change of management practices and in turn worker health and effectiveness. Given that job stress prevention strategies are now becoming more popular in organisations (Noblet & LaMontagne, 2006) and also in Malaysian workplace settings with initiatives from the government to promote healthy working conditions, we consider building a strong PSC may play a key role. Criticisms regarding current practices of job stress prevention suggest that they focus too much on the individual without consideration of working conditions (Noblet & LaMontagne, 2006). We believe that focussing on PSC can remedy this problem. Managers should be informed about the importance of PSC in the workplace.

Limitations and future research

There are some limitations to the current research. The current study used cross-sectional data therefore causal conclusions regarding the direction of the proposed relationships cannot be drawn. However, previous longitudinal research lends some support to the proposition that PSC precedes work conditions (Bond *et al.*, 2010; Dollard & Bakker, 2010). Further, our population-based study did not provide the opportunity for aggregation of data, therefore it is plausible that the perceptions of organisational PSC could be influenced by individual factors. Additionally one of the possible problems caused by cross-sectional research is common-method variance (Demerouti *et al.*, 2005). To assess this problem, we conducted the Harman test and found no common factor underlying all of our measures. Therefore,

we believe that the relationships we report are substantive and not based on common method effects.

Consistent with previous research, we used a self-rated questionnaire to assess performance (i.e. Demerouti *et al.*, 2005). Although objective measurement could more reliably assess employee performance (i.e. Bakker *et al.*, 2008; Janssen, Lam & Huang, 2010), our respondents were from a variety of occupations and organisations, so it was impractical to use objective performance measures.

We operationalised PSC in terms of perceptions but another way to capture PSC would be to evaluate the change process in work stress interventions, as an effective intervention should lead to changes in PSC, that is, changes to policies, practices and procedures in relation to worker psychological health. One study has operationalised PSC in terms of actions, progress and process in a work stress intervention (Dollard & Karasek, 2010). The authors showed that high PSC enabled the utilisation of resources (i.e. decision influence); in other words, under conditions of high PSC the beneficial negative relationship between decision influence and change in emotional exhaustion and psychological distress held, whereas the strength of the relationship was reduced under conditions of low PSC. Further, the dual functionality of PSC as a precursor to working conditions, as well as a potential ameliorator of them requires further investigation.

Future research could give attention to other types of job demands and job resources and other types of psychological symptoms (e.g. depression, anger) or other positive reactions (e.g. flow; Csikszentmihalyi, 1990) This is important, as recent Malaysian research found that employees are likely to express anger (Idris, Dollard & Winefield, 2010) and depression in the face of high job demands (Edimansyah *et al.*, 2008). Future research should also employ a longitudinal design to confirm the directional effects suggested by the models.

Conclusion

The present study adds to the literature in several ways. It proposes and provides support for the proposition that PSC is a precursor to job demands and job resources and therefore is a likely trigger of the health erosion and work motivation paths as formulated in the JD-R model. The propositions of the PSC model and, by implication, the JD-R model are confirmed in a Malaysian sample quite diverse from those usually investigated, that is, an Eastern developing economy, which is largely Muslim. The research helps to build a more inclusive world picture of healthy productive work.

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