We integrated psychosocial safety climate (PSC) with the job demands and resources (JD-R; Bakker & Demerouti, 2007) framework to examine the impact of both job demands and job resources at work on employee depression, anger, and engagement. PSC refers to a climate for the protection of employee psychological health and safety. As PSC theoretically influences the working environment, we hypothesized that PSC would have an indirect effect on specific negative emotions (e.g., anger, depression) via job demands and an indirect effect on positive emotion (e.g., engagement) through job resources. We used a population-based sample consisting of 269 public and private employees from the State of Selangor, Malaysia. Overall, results using structural equation modeling showed that PSC negatively related to job demands and positively related to job resources. In mediated paths, job demands carried the effect of PSC on anger and depression, whereas job resources carried the effect of PSC on engagement. We also showed that job demands related negatively to engagement, and that the effect was carried by anger and depression. Using multigroup analysis, we found that the model was invariant within both the public and private sectors. These findings suggest that JD-R theory may be expanded to include PSC as an antecedent, and that the PSC model is largely valid in an Eastern, Muslim, developing economy setting.

Keywords: psychosocial safety climate, JD–R model, work engagement, depression, anger
In this paper we investigated the effects of organizational psychosocial safety climate (PSC) together with job demands and job resources, on negative and positive emotions in the workplace. PSC is defined as “policies, practices, and procedures for the protection of worker psychological health and safety” (M. F. Dollard & Bakker, 2010, p. 580). We tested a theoretical model of PSC that extended the job demand and resources (JD-R) framework of work stress and introduced PSC as an organizational antecedent to work conditions. To be specific, we examined the effects of PSC on emotions that are mediated via work conditions.

The JD-R model (Bakker & Demerouti, 2007) provides a theoretical framework that enables the exploration of both positive and negative pathways regarding psychology at work. Empirical studies have supported the proposition that chronic job demands (or stressors) are likely to contribute to negative aspects of emotions, such as burnout (Schaufeli & Bakker, 2004) or depression (Hakanen, Schaufeli, & Ahola, 2008). Evidence also is found supporting the proposition that job resources enhance employees’ motivation in the form of engagement and flow (Bakker & Leiter, 2010). Although the JD-R model postulates both positive and negative aspects of work, most studies have focused on burnout on the negative side and engagement on the positive side. Only one study has used depression in the JD-R framework (Hakanen, Schaufeli, & Ahola, 2008). Our study therefore sought to uniquely examine a range of emotions, that is, anger, depression, and engagement, as outcomes of the JD-R model. Given that most studies of the JD-R model are conducted within Western cultures we sought to test the validity of this extended model in an Eastern sample of Malaysian employees.

**SOCIOCULTURAL CONTEXTUAL BACKGROUND OF MALAYSIA**

Malaysia is one of the fastest emerging and most successful economies in Southeast Asia (*World Competitiveness Yearbook*, 2007). It is considered a multiethnic country, as it includes Malays (50%), Chinese (35%), Indian (10%), and indigenous people (5%) (Pope, Musa, Singaravelu, Bringaze, & Russell, 2002). In general, Malaysia is a Muslim-dominated country but other religions are also freely\(^1\) practiced (Neo, 2006). Although the three dominant groups have their own unique culture, in general, Malays and indigenous ethnics as the native groups receive special treatment and mainly dominate political parties and government policy making. In terms of cultural characteristics, the Malaysian culture is different from many Western cultures: It is

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\(^1\) Freedom of religion only applies to non-Malays. For Malays ethnic, the native ethnic in Malaysia must profess the Muslim religion (see Neo, 2006).
collective rather than individualistic, is concerned to maintain harmonious relationships, has a high level of power distance, and shows much respect for elders and people in high positions (Abdullah, 1992). Malaysia is a country that holds conservative values (Schwartz, 1999), promoting obedience and self discipline. Nevertheless, Malaysia shares similarities with developed countries as well and is rated high on education indicators (i.e., adult literacy), similar to some European nations (i.e., Sweden) and Australia (Georgas & Berry, 1995). Although traditional cultural values influence social behavior, including in the workplace (Georgas & Berry, 1995), we expect that cultural issues do not affect working conditions very much as assessed in this study (particularly job demands and resources) because Malaysia has adopted Western systems (especially British) in job design (Malek, Mearns, & Flin, 2010; Pope et al., 2002), in education (Pope et al., 2002), and also uses British Common Law (Neo, 2006).

In relation to the emotional expression of work stress, Muslim workers are expected to follow the religious philosophy of redha and tawwakal and thereby be fully accepting of a situation and not show their negative emotions such as depression or anger even if it is difficult (Idris, Dollard, & Winefield, 2010). However, recent research in Malaysia using in-depth interviews found that depression and anger were both significantly related to employees’ perceptions of job stress (Idris et al., 2010). The results of both Eastern and Western studies show that job demands are correlated with depression (Chen, Siu, Lu, Cooper, & Phillips, 2009). Further Asian employees tend to manifest their anger via anxiety or depression rather than by expressing it directly (Liu, Spector, & Shi, 2007). However, because most Eastern (Asian) studies have focused mainly on Chinese employees and their workplaces, this study fills a gap regarding research on emotions in the workplace by examining the state of affairs in a different type of Eastern country, specifically a Muslim country—Malaysia.

**PSYCHOSOCIAL SAFETY CLIMATE AND WORKPLACE CONDITIONS**

According to the JD-R model, *job demands* refer to any aspect of the job that requires people to expend physical, cognitive, and emotional effort (Bakker & Demerouti, 2007). Although job demands do not necessarily have negative effects, as some demands may provide a positive challenge (Podsakoff, LePine, & LePine, 2007), studies have revealed that employees who continually experience certain types of job demands (e.g., role conflict, emotional demands) are likely to experience negative emotional reactions and an erosion of health over time. This is particularly the case when people
use personal resources and energy to deal with chronic demands (Bakker & Demerouti, 2007).

Job resources refer to any aspects of a job that facilitate work goals and reduce demands (Bakker & Demerouti, 2007). Job resources also play a motivational role (e.g., intrinsic and extrinsic) for employees. The JD-R model proposes two paths: (1) the health erosion pathway, which describes the relationship between job demands and burnout and (2) the motivation pathway, which describes the relationship between job resources and work motivation and production outcomes.

Psychosocial safety climate theory (see Figure 1) describes and explains the mechanisms via which PSC relates to workplace conditions work-related emotions and important work outcomes, by extending the JD-R model (Bakker, Demerouti, & Verbeke, 2004). Our theoretical framework was developed on the basis that PSC is an indicator of the extent of concern that employers have for employees’ psychosocial well-being (Hall, Dollard & Coward, 2010), and that working conditions are largely created by senior management (M. F. Dollard & Karasek, 2010). Following M. F. Dollard and Bakker (2010), we consider PSC to be a precursor or precondition to both the health and motivation pathways of the JD-R model because of its relationship to both demands and resources. Employers who value psychosocial health (high PSC), will create job demands that can be effectively managed (i.e., workload, emotional demands). Communication systems will be in place so that risks can be identified and managed, for example through better allocation of workload or by providing greater opportunity for recovery. There will be strong participation and involvement of all levels of the organization in stress prevention. Managers who have little regard for workers’ well-being, such as in a low PSC environment will ignore high demand scenarios. Chronic exposure to demands will in turn trigger the erosion of health, which manifests as emotional reactions and stress-related health outcomes (M. F.

![Figure 1](image_url). Study model: Psychosocial safety climate as a precursor of job demands and job resources and its relationship to emotions at work. H = hypothesis.
Dollard & Bakker, 2010). This leads to Hypothesis 1: PSC will negatively relate to work demands (see Figure 1).

The next step in the model concerns the relationship between job demands, anger, and depression. Studies have revealed that emotional demands (Xanthopoulou et al., 2007) and role conflict are sources of stress in the workplace. Anger is conceived as a negative affective-cognitive state and a common workplace emotion (Booth & Mann, 2005). Demands are likely to lead to anger via a number of processes, such as frustration (Neuman & Baron, 2005). According to the classic Dollard–Miller frustration-aggression hypothesis (J. Dollard, Doob, Miller, Mowrer, & Sears, 1939), anger and aggression may be the end result of built-up frustration. People may perceive that higher job demands are a result of unjust or unfair practices such as workload being unevenly distributed, and, feeling frustrated by being unable to achieve their work goals, may react in anger (Domalgalski & Steelman, 2007; Smith, Roman, Dollard, Winefield, & Siegrist, 2005; Spector, Fox, & Domagalski, 2006). In line with the conservation of resources (COR) approach, in the face of high demands, personal resource loss also may occur and in turn lead to anger, as is evident in studies of patients who suffered chronic obstructive pulmonary disorder (Lane & Hobfoll, 1992).

Empirical Western research shows that high job demands are associated with depression (Hakanen, Schaufeli, & Ahola, 2008; Siegrist, 2008). Two Eastern (Malaysian) studies also have found that psychological demands are associated with depression (Panatik, O’Driscoll, & Anderson, 2009). However, both of these Eastern studies used a very specific sample (i.e., technical workers), rather than population-based multi-occupational samples, raising questions over the generalizability of findings.

Studies confirming the relationship between workplace characteristics and anger and depression utilizing other job stress frameworks are well documented (Hoggan & Dollard, 2007; Smith et al., 2005). A commonly held belief is that in an Eastern Muslim collective culture, the norm is not to express anger directly, but to express it indirectly via anxiety (Liu et al., 2007). However, based on Idris et al.’s (2010) qualitative finding, we proposed to examine anger and depression as outcomes of the JD-R model. Thus, we predict the following two hypotheses:

**Hypothesis 2a:** Job demands will have a positive relationship with anger.

**Hypothesis 2b:** Job demands will have a positive relationship with depression.

So far we proposed that PSC is related to demands, and job demands are positively associated with anger and depression. However, as M. F. Dollard and Bakker (2010) theorized, PSC may influence employees’ health erosion,
and negative emotional reactions such as exhaustion, depression, and anger, through its effect on job demands. In essence this suggests that PSC is a trigger of demand related emotional reaction. Previous research (e.g., M. F. Dollard & Bakker, 2010; Idris, Dollard, & Winefield, 2011) has found that job demands mediated the relationship between PSC and psychological strain (i.e., burnout). However, the relationship has not yet been tested in relation to specific negative emotions. Taken together, we propose an extended health erosion path, such that job demands will mediate the relationship between PSC and anger (Hypothesis 3a) and between PSC and depression (Hypothesis 3b).

Anger and depression are in turn likely to affect worker motivation. Following Hockey’s (1997) proposition regarding the passive coping mode, we assume that people who are trapped in negative affective-cognitive states (e.g., anger) 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). Glomb’s (2002) qualitative research (N = 37 interviews) found that most employees reported that anger decreased their job performance (49%; n = 18), whereas only a few respondents indicated that anger enhanced their performance (19%, n = 7). People who feel angry or perceive that they have been treated unfairly tend to sabotage their work or become deliberately ineffective (Fox & Spector, 1999). We propose the next two hypotheses:

Hypothesis 4a: Anger will negatively relate to work engagement.

Hypothesis 4b: Depression will negatively relate to work engagement.

Next we address the resource-related motivational pathway of the model. First, the relationship between PSC and job resources can be understood in terms of the priority that senior management gives to the psychological well-being of workers. If senior management prioritizes and values the psychological health of workers, then they will ensure that workers have enough resources to foster growth, learning, and development (Schaufeli, Bakker, & Van Rhenen, 2009). In support of this, M. F. Dollard and Bakker (2010) found that PSC was positively associated with a change in job resources (skill discretion) over time. Therefore, we predict Hypothesis 5: PSC will positively relate to job resources.

The relationship between job resources and engagement is a core process in JD-R theory and can be explained using social exchange theory (Blau, 1964). Basically, if employers “take care of employees” (Croppanzano & Mitchell, 2005, p. 882), employees will make an effort in their jobs and experience a positive affective-cognitive state. Employees’ who receive reasonable resources from their work environment will invest their efforts
toward their job (Schaufeli & Bakker, 2004). Therefore we propose, Hypothesis 6: Job resources will positively relate to work engagement.

Taken together, we propose that PSC will positively relate to engagement through job resources (Hypothesis 7).

Finally, we propose that anger (Hypothesis 8a) and depression (Hypothesis 8b) will mediate the relationship between job demands and engagement. Findings from previous studies suggest that negative emotions are associated with counterproductive behavior (Spector & Fox, 2002), and workplace sabotage (Spector et al., 2006). We expect that individuals who feel anger due to high job demands, will be more likely to decrease their job potential (i.e., work engagement), rather than invest more energy in their work. Similar to anger, depressed employees also are likely to be ineffective in their job because more time and resources are needed to deal with depression, rather than be motivated at work. A study among 429 technical employees in a large telecommunication company in Malaysia, for example, found that depression mediated the relationship between job demands (e.g., responsibility demands) and job performance (Panatik et al., 2009).

To date only one study in Malaysia has been conducted using a similar framework. The study found that PSC was related to both burnout and positive emotions (e.g., engagement) via workplace conditions (Idris et al., 2011), and in turn related to employee performance. Using a different sample, we go further here by examining different types of negative emotions to test empirically whether depression and anger are predictable consequences of high demand work situations as they are in Western contexts. The null hypotheses for the study are that: (1) PSC is not related to demands and resources, (2) there is no mediated relationship between PSC and emotional responses and engagement, and (3) there is no mediated relationship between job demands and engagement via emotions.

METHOD

Participants and Procedure

A survey was conducted in all nine districts in Selangor, a state of Malaysia, as part of a larger population-based study on psychosocial risk factors at work. Based on addresses provided by the Malaysian Statistical Department, 1,073 households were approached by research assistants during weekends and off-work days. Participation in the study was voluntary, and only those participants who were actively working were selected. In accord with a representative and independent sampling frame only one participant was chosen from each residence. From the total households selected, only 750 participants were willing to
participate (70% response rate). As we only consider participants from the formal work sector, 174 participants who either self-employed or worked for the informal sector (i.e., farmer) were omitted, resulting in 576 participants. A random sample of 269 participants was used in the current study. The remainder was used to study a different research question.

The research participants were 128 men (47.7%), and the majority of respondents were of Malay ethnicity ($N = 219, 84\%$). Nine response age-range response choices were offered, ranging from under 20 to 62 and over ($SD = 1.68$), most respondents indicated they were between Categories 2 and 6, ranging in ages between 20 and 49 (82.5%). Most were in nonmanager positions ($N = 241, 91.6\%$) and only 22 respondents had a managerial position (8.2%). Six participants did not indicate their position. The level of education was mostly secondary school ($N = 136, 50.9\%$), most were married ($N = 182, 67.7\%$) and most ($N = 167, 62.1\%$) worked for private organizations, with the remainder working in public sector agencies ($N = 102, 37.9\%$).

**Instruments**

Unless otherwise indicated the instruments used in this study were translated into Malay by two native speakers, using back translation (Brislin, 1970). Initially, the original English-language measures were translated into Malay by the first translator, and then the Malay questionnaires were back-translated into English by the second translator who had not seen the original English measures. Translators were trained in the field of psychology, and had been educated in Australia and the United Kingdom. As there were no discrepancies between the original and back-translated version, the measurements in the study were considered to have meaning equivalence (Weeks, Swerissen & Belfrage, 2007) and were valid to use.

Demographic variables were gender, age, education, ethnicity, and type of employer. Coding was as follows; for gender ($1 = male, 2 = female$), age ($1 = below 20, 2 = 20 to 25, 3 = 26 to 31, 4 = 32 to 37, 5 = 38 to 43, 6 = 44 to 49, 7 = 50 to 55, 8 = 56 to 61, 9 = 62 and above$), education ($1 = primary, 2 = secondary, 3 = diploma, 4 = technical certificate/diploma, 5 = bachelor, 6 = post graduate$), ethnicity ($1 = Malay, 2 = other$) and employer ($1 = public, 2 = private$).

Psychosocial safety climate was assessed by using a 12-item, PSC scale (PSC–12) derived from the 26-item version (Hall et al., 2011). The questionnaire contains four subscales: management commitment, organizational communication, management priority, and organizational participation. The PSC scales have good validity and reliability as reported in previous research (Hall et al., 2011; Idris et al., 2011), with alpha values for the subscales.
ranging from .81 to .89. The response scale ranged from 1 (strongly disagree) to 5 (strongly agree). Example questions are: “In my workplace senior management acts quickly to correct problems/issues that affect employees’ psychological health” (management commitment), “There is good communication here about psychological safety issues which affect me” (organizational communication), “Senior management clearly considers the psychological health of employees to be of great importance” (management priority), and “Participation and consultation in occupational health and safety issues occurred with employees, unions, and occupational health and safety representatives” (organizational participation). We compared a four-factor model of PSC against a one-factor PSC. We used five absolute fit indexes (cf. Jöreskog & Sörbom, 1986): chi-square goodness-of-fit statistic (GFI), comparative fit index (CFI), Tucker–Lewis index (TLI), and root mean square error of approximation (RMSEA). For GFI, CFI, and TLI, values greater than .90 and smaller than .08 for RMSEA are acceptable (Byrne, 2001). We found that a four-factor model with all fit indexes at acceptable levels; GFI = .95, CFI = .97, TLI = .96, RMSEA = .06, fit the data better than a one factor model of PSC; GFI = .80, CFI = .82, TLI = .79, RMSEA = .14, and the differences between both models were also significant, \( \Delta \chi^2(6) = 243, p < .001 \). All subscales were intercorrelated as well, rendering the subscales ideal indicators of the latent construct PSC.

Job demands consisted of emotional demands and role conflict, which were assessed using the respective four-item scales from the Copenhagen Psychosocial Questionnaire (COPSOQ; Kristensen, Hannerz, Hogh, & Borg, 2006). A 4-point response scale was used ranging from 1 (strongly not agree) to 4 (strongly agree). A sample question for emotional demands is: “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?”

Job resources were examined using the supervisor support and coworker support subscales from the Job Content Questionnaire (JCQ; Karasek, 1979). Supervisor support was assessed using five items, for example: “My supervisor/manager is concerned about the welfare of those under him/her.” Coworker support was assessed using six items, for example: “People I work with are competent in doing their jobs.” A reverse item, “I am exposed to hostility or conflict from the people I work with,” was omitted as it showed low reliability. Responses for both scales were based on a 4-point scale ranging from 1 (strongly not agree) to 4 (strongly agree). All of these scales are derived from the Malay version of the JCQ (Edimansyah et al., 2008).

Anger was assessed by the feeling anger and physical anger subscales of the State–Trait Anger Expression Inventory (STAXI; Spielberger, Reheiser, & Sydeman, 1995). Each comprised five items, and used a 4-point response scale ranging from 1 (not at all) to 4 (very much so). A sample item for
feeling anger is, “I am furious” and for physical anger, “I feel like breaking things.” The STAXI is regarded as a reliable and valid instrument to measure anger in both normal and psychiatric patients, and shows a strong relationship with other psychological and health symptoms (see Spielberger & Reheiser, 2009).

Depression was measured with nine items from the Patient Health Questionnaire (PHQ–9; Spitzer, Kroenke, & Williams, 1999). Responses ranged from 1 (not at all) to 4 (nearly every day). A sample item is: “During the last month, how often were you bothered by feeling down, depressed or hopeless?”

Engagement was measured by using three subscales—vigor, dedication, and absorption—derived from a shortened version of the Utrecht Work Engagement Scale (UWES–9, Schaufeli, Bakker, & Salanova, 2006). Responses were scored on a 7-point scale ranging from 0 (never) to 6 (always). Each subscale was examined with three-items. Sample questions are: “At my work, I feel bursting with energy” (vigor), “I am enthusiastic about my job” (dedication), and “I am immersed in my work” (absorption). Alpha coefficients for the measures are shown in Table 1.

Analysis Strategy

Prior to using structural equation modeling analysis to test hypotheses, we evaluated intercorrelations among all variables (see Table 1). Second, as we used a cross-sectional study, we conducted Harman’s one-factor test to determine whether common-method variance was a serious problem (Podsakoff & Organ, 1986). An unrotated factor analysis of all study items yielded 13 factors in total explaining 70.34% of the variance. Given that a single factor did not emerge, 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).

Next the research model (see Figure 1) was tested using structural equation modeling (SEM) using AMOS 17 (Arbuckle, 2008). We evaluated our model by using five absolute fit indexes (cf. Jöreskog & Sörbom, 1986): chi-square goodness-of-fit statistic, CMIN/df, GFI, CFI, TLI, and RMSEA. For GFI, CFI, and TLI, values greater than .90 indicate an acceptable fit and a value smaller than .08 is acceptable for the RMSEA (Byrne, 2001). For CMIN/df (minimum discrepancy divided by the degrees of freedom) the value below 5 is considered acceptable, with lower values being superior (Johnson & Rapp, 2010). The measurement model comprised six latent measures (and their indicators): PSC, job demands, job resources, depression, anger, and engagement.
Table 1. Means, Standard Deviations, and Correlation Between the Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
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<th>Items</th>
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</thead>
<tbody>
<tr>
<td>1. PSC communication</td>
<td>7.87</td>
<td>1.94</td>
<td>.73</td>
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<td>2. PSC commitment</td>
<td>8.18</td>
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<td>3. PSC priority</td>
<td>8.52</td>
<td>2.12</td>
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<td>4. PSC participation</td>
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<td>5. Emotional demands</td>
<td>1.24</td>
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<td>6. Role conflict</td>
<td>1.37</td>
<td>0.77</td>
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<td>7. Coworkers support</td>
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<td>8. Supervisor support</td>
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<td>.92</td>
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<td>9. Depression</td>
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<td>11. Physical anger</td>
<td>5.30</td>
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<td>12. Vigor</td>
<td>4.35</td>
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<td>13. Dedication</td>
<td>4.50</td>
<td>1.34</td>
<td>.84</td>
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<td>14. Absorption</td>
<td>3.80</td>
<td>1.47</td>
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<td>15. Gender</td>
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<td>-.07</td>
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</tbody>
</table>

Note. N = 269. PSC = psychosocial safety climate.
*p < .05. **p < .01.
We followed Baron and Kenny’s (1986) four-step approach to establish full mediation: (1) the independent measure is significantly associated with the outcome variable to confirm that there is an effect to be mediated; (2) the independent measure is significantly associated with the mediator; (3) the mediator is significantly associated with the dependent variable, controlling for the independent variable; and finally (4) to establish full mediation, the effect of the independent measure in Step 3 is reduced to zero. Where Step 4 is not met, then only partial mediation is indicated.

We first assessed the null hypothesis model (M0). We then tested the direct effect model (M1): PSC → demands, PSC → depression, PSC → anger, PSC → job resources, and PSC → engagement; and all other paths were set to zero. We then tested a fully mediation model (hypothesized model; M2): PSC → job demands, job demands → depression, job demands → anger, PSC → job resources, job resources → engagement, depression → engagement, and anger → engagement. Then we tested a partial mediation model (M3) that was to the same as M2 but with additional direct paths between PSC → depression, PSC → anger, and PSC → engagement.

**Competing Models**

Due to the cross-sectional nature of the current study, we tested competing models to rule out the possibility of reversed effects (Cole, Walter, & Bruch, 2008). For example, employees who suffer with negative emotions (e.g., depression, anger) also may report that they experience high job demands, and in turn low PSC. In parallel, engaged employees may report good job resources, and higher PSC. First, we tested a direct effect reverse model (M4) with a path from anger → PSC, depression → PSC, engagement → PSC, job demands → PSC, and job resources → PSC. We followed this analysis by fully mediated reversed model, M5, that included a path between anger → demands, depression → demands, engagement → anger, engagement → depression, engagement → resources, demands → PSC, and resources → PSC. Finally we tested another competing model, M6, a reversed partial mediation model, by adding to M5, a path between depression → PSC, anger → PSC, and engagement → PSC.

Next we formulated a competing model to see whether PSC is a mediator between job demands and job resources, and the emotion variables. First, we modeled M7 with paths between demands → PSC, job resources → PSC, PSC → anger, PSC → depression, PSC → engagement, anger → engagement, and depression → engagement. We also created another model M8 to determine if PSC is a mediator between emotion variables and work conditions. Paths were from anger → PSC, depression → PSC, engagement → PSC, PSC → job demands, and PSC → resources.
Finally, we validated the hypothesized model M2, using multigroup analysis. We separated two random samples, consisting of public (N = 102) and private employees (N = 167). We compared two models M9 and M10: One when the paths of the measurement and structural models were constrained to be equal, and the second in which the structural weights and structural residuals were estimated freely and the paths were not constrained to be equal, respectively. If there is no significant improvement in the model when the paths are estimated freely we can conclude that the models are equivalent, and there would be no support for the null hypotheses.

RESULTS

In Table 1, the means, standard deviation, and correlation between the variables are presented.

First, we analyzed the relationships between the demographic variables (i.e., gender, age, education, and ethnicity) and the research variables. In general, most of the demographic variables were not related to research variables in the study so were not included in subsequent analyses. Correlations involving the demographic variables and research variables are shown in Table 1.

To test the eight proposed hypotheses, we first used the full sample to test our study model. Our analysis model (M1, M2, and M3) results are shown in Table 2. The model M1 did not fit the data well as the TLI value was below .90. All fit indexes for the fully mediated model (M2) improved and the improvement was significant against the M1 model, with GFI, CFI and TLI (.96, .99 and .98, respectively) and RMSEA (.03) all at acceptable levels. All paths also were significant (p < .01). The fit indexes for M3 model were also at an acceptable level, but the fit was not significantly better than the more parsimonious M2 model.

As shown in Table 2, none of the fit indexes for M4 were satisfactory. For M5, all fit indexes were satisfactory and all paths were significant (p < .001), except the path from demands → PSC. In comparison to M2, the Akaike Information Criterion (AIC) and the chi-square to degrees of freedom ratio (CMIN/df) were higher than M2 indicating a worse fit. For the M6 model, all fit indexes were satisfactory, but the AIC and CMIN/df were again higher than in M2 indicating a worse fit. Further, the paths between demands → PSC, depression → PSC, anger → PSC, and engagement → PSC were not significant. For M7, none of the fit indexes were as good as M2, and the path between job demands → PSC was not significant. The M8 model did not fit the data well as the value of TLI fell below .90, and none of the fit indexes were as good as M2. In relation to the multigroup analysis we found that there was no significant
Table 2. Comparison of Alternative Models

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>df</th>
<th>GFI</th>
<th>CFI</th>
<th>TLI</th>
<th>RMSEA</th>
<th>AIC</th>
<th>CMIN/df</th>
<th>$\Delta(df)$, $\chi^2$</th>
<th>Comparison</th>
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<tr>
<td>M0. Null model</td>
<td>1,690.80</td>
<td>105</td>
<td>.44</td>
<td>.00</td>
<td>.00</td>
<td>.23</td>
<td>1,720.80</td>
<td>16.103</td>
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<tr>
<td>M1. Direct effect model</td>
<td>202.48</td>
<td>71</td>
<td>.90</td>
<td>.91</td>
<td>.89</td>
<td>.08</td>
<td>270.48</td>
<td>2.582</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M2. Fully mediated model</td>
<td>88.56</td>
<td>69</td>
<td>.96</td>
<td>.99</td>
<td>.98</td>
<td>.03</td>
<td>160.56</td>
<td>1.284</td>
<td>(2), 113.917***</td>
<td>M2 versus M1</td>
</tr>
<tr>
<td>M3. Partial mediation model</td>
<td>83.11</td>
<td>66</td>
<td>.96</td>
<td>.99</td>
<td>.98</td>
<td>.03</td>
<td>161.10</td>
<td>1.125</td>
<td>(3), 5.45 ns</td>
<td>M3 versus M2</td>
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<td>M4. Direct effect model</td>
<td>235.66</td>
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<td>.89</td>
<td>.86</td>
<td>.09</td>
<td>303.66</td>
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<td>M5. Fully mediated model</td>
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<td>69</td>
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<td>.98</td>
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<td>.04</td>
<td>167.86</td>
<td>1.389</td>
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<td>M6. Partial mediation model</td>
<td>96.02</td>
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<td>.96</td>
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<td>174.01</td>
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<td>Competing models (PSC as mediator)</td>
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<tr>
<td>M7</td>
<td>165.65</td>
<td>69</td>
<td>.92</td>
<td>.94</td>
<td>.92</td>
<td>.07</td>
<td>237.65</td>
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<td>M8</td>
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<tr>
<td>M9. Constrained</td>
<td>208.41</td>
<td>155</td>
<td>.91</td>
<td>.97</td>
<td>.96</td>
<td>.04</td>
<td>318.41</td>
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<tr>
<td>M10. Unconstrained</td>
<td>188.48</td>
<td>140</td>
<td>.91</td>
<td>.97</td>
<td>.96</td>
<td>.04</td>
<td>328.48</td>
<td></td>
<td>(15), 19.92 ns</td>
<td>M9 versus M10</td>
</tr>
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</table>

Note. $N = 269$. GFI = goodness-of-fit; CFI = comparative fit index; TLI = Tucker–Lewis index; RMSEA root mean square error of approximation; AIC = Akaike Information Criterion; CMIN/df = minimum discrepancy divided by the degrees of freedom; M = model; PSC = psychosocial safety climate.

*** $p < .001$. 

Psychosocial Safety Climate
improvement in the model when the paths are estimated freely so we conclude that M9 is a good fit to both the private and public sector data sets (equivalent to M2 the theoretical model). In other words, the model is invariant across groups, and the model M2 is validated. Taking all results together we determined that the best fitting model was M2. Next we assessed each of the hypotheses based on the results of M2 (See Figure 2).

Hypothesis 1 proposed that PSC is negatively related to job demands. Model M2 shows that PSC negatively and significantly relates to job demands ($\beta = -0.24, p < .01$), confirming Hypothesis 1. This finding indicates that higher PSC in the organization will be associated with the creation of less job demands. Next, supporting Hypothesis 2a, which proposed that job demands will have a positive relationship to anger, our analysis found that job demands is positively and significantly related with employee anger ($\beta = 0.52, p < .001$). In relation to Hypothesis 2b, we predicted that job demands will positively and significantly relate to depression. Results showed that there was a positive correlation between job demands and depression ($\beta = 0.61, p < .001$), again confirming our prediction.

To confirm the meditational hypothesis, and the extended health erosion pathway, that PSC influences the relationship to both anger (Hypothesis 3a) and depression (Hypothesis3b) through job demands, we assessed the significance of the indirect effect using the Sobel test. Our analysis revealed that job demands mediated the relationship between PSC and anger (indirect effect: $\beta = -0.07$, Sobel = $-2.69$, $SE = 0.07$, $p < .01$) and the relationship between PSC and depression (indirect effect: $\beta = -0.14$, Sobel = $-2.71$, $SE = 0.01$, $p < .01$).

Figure 2. Psychosocial safety climate as a precursor of job demands and job resources and its relationship to emotions at work. $N = 269$. ** $p < .01$. *** $p < .001$. 
Although the often used Baron and Kenny (1986) mediation steps require a significant relationship between independent and outcome variable, recently Cole et al. (2008) argued that this approach is sometimes limited, especially when the mediation process becomes more complex; thus the significant relationship between the antecedent and criterion variable is no longer necessary. Nevertheless, we found that in the direct effects model (M1) the relationship between PSC and anger was significant at the one-tailed level. As recommended by Cole et al. and also as suggested by Preacher and Hayes (2004), when testing a mediation effect, a significant indirect effect, confirmed using a Sobel test, is sufficient to indicate mediation in our data.

Hypotheses 4a and 4b proposed that anger and depression are both negatively related to engagement. The results indicated that anger ($\beta = -0.19$, $p < .01$), and depression ($\beta = -18$, $p < .01$) were both negatively and significantly related to engagement supporting Hypotheses 4a and 4b.

In relation to the extended motivational pathway, first, Hypothesis 5 proposed that PSC is positively related to job resources; we found that the relationship was positive and significant ($\beta = .70$, $p < .001$) confirming our hypothesis. Next, in Hypothesis 6, we proposed that job resources will be positively associated with work engagement, and the result ($\beta = .32$, $p < .01$) again supported our prediction. Finally to test the motivational pathway, that job resources mediated the relationship between PSC and engagement as predicted in Hypothesis 7, the Sobel test revealed that the indirect effect is significant (indirect effect: $\beta = .04$, Sobel = 1.85, $SE = 0.06$, $p < .05$, one-tailed). In the main effects model the direct relationship between PSC and engagement was significant ($p < .001$). These findings support the proposition that high PSC will lead to high job resources that in turn relate to employee engagement in organizations, consistent with the extended motivational pathway of PSC theory (M. F. Dollard & Bakker, 2010; M. F. Dollard & Karasek, 2010).

In relation to Hypothesis 8, we proposed that (a) anger and (b) depression will mediate the relationship between job demands and engagement. In the main effects model the direct relationship between job demands and anger ($\beta = .53$), and job demands and depression ($\beta = .61$) were both significant $p < .01$. Our analyses revealed that anger mediated the relationship between job demands and engagement (indirect effect: $\beta = -.08$, Sobel = $-2.24$, $SE = 0.10$, $p < .05$), and depression mediated the relationship between demands and engagement (indirect effect: $\beta = .03$, Sobel’s $t = -2.16$, $SE = 0.09$, $p < .05$). The results supported Hypothesis 8a, and Hypothesis 8b, respectively.

Together our results supported the notion of PSC as an antecedent to working conditions (M. F. Dollard & Bakker, 2010), with high job demands leading to increased negative emotions, and job resources leading to increased employee engagement. In turn anger and depression are related to reduced employee engagement.
DISCUSSION

The main purpose of the present study was to evaluate the effect of PSC on work-related emotions (anger, depression, engagement) through job demands and resources. Based on the main assumptions of PSC theory proposed by M. F. Dollard and Bakker (2010) and M. F. Dollard and Karasek (2010), we tested an integrative model of psychosocial safety climate, that extends JD-R work stress theory (Bakker & Demerouti, 2007). We theorized that PSC would precede the health and motivation pathways of the JD-R model.

Our hypotheses were largely supported. In line with the extended health erosion pathway, PSC indirectly impinged on negative emotions (anger and depression), through job demands. PSC also indirectly affected positive emotions (i.e., work engagement) through job resources, consistent with the extended motivational pathway. The current findings supported the integrative framework of PSC and the JD-R model (Idris et al., 2011). Our findings also are consistent with the JD-R model and show that job demands may adversely affect employee health, whereas job resources may improve employee engagement (Bakker, 2009; Schaufeli et al., 2009). Our finding of a significant relationship between job demands and indicators of psychological impairment, such as anger and depression, is a significant contribution to the literature because most empirical tests of the JD-R model focus on burnout (Hakanen et al., 2008). Empirically we confirm that job demands affect negative emotions other than burnout. We find it interesting that although most Asian studies have reported a link between the work environment and employees experiencing depression and low levels of well-being, most of these studies have been among non-Muslim communities (Liu et al., 2007; Tsui, 2008). Jamal (2010) in his cross-cultural study across four countries (Canada, China, Pakistan, and Malaysia) found that job demands related to burnout for all studied samples and showed that modern working conditions have a similar impact on employees’ psychological health cross-culturally. Our study among predominantly Malaysian Muslim employees revealed similar findings to studies of Western samples. It shows that work and working conditions influence the decline of employee well-being, even in communities that are considered to be more tolerant of adverse situations (Idris et al., 2010).

Furthermore, although negative emotions, such as anger, sometimes enhance employee motivation and their effort to achieve certain goals, this was not the case in our study. We found that anger and depression both negatively influenced employee engagement. In other words, even though engaged employees are expected to feel joy about their job (Bakker & Leiter, 2010), high job demands could reduce the positive impact of job resources. In particular anger and depression may reduce motivation. Employees who
are trapped in anger or negative emotion (i.e., depression) may also intend to leave their organization, but may be unable to do so. This may be the case as in the context of our study, Malaysia, there is currently high job insecurity. To compensate employees may reduce their engagement. Theoretically the way anger relates to reduced work outcomes could also be due to a revenge, and a counterproductive kind of reaction (Fox & Spector, 1999; Spector et al., 2006), rather than via (or perhaps in addition to) exhaustion due to burnout.

A main theoretical innovation in our study was the exploration of specific negative emotions, anger, and depression as an outcome of job demands. Our research shows this is an important theoretical addition. We find that the demands to anger path is as adequately described by “health erosion” as negative emotions, such as anger/depression, can be as debilitating to health (e.g., cardiovascular disease, Smith et al., 2005).

More important tests of alternative reverse models did not provide any support for the notion that perceptions of work demands and work resources, and the experience of emotions affects the perception of PSC. This result is consistent with the theoretical idea that PSC is a property of the organization and a precursor to job conditions (M. F. Dollard & Bakker, 2010).

In summary we found that higher PSC predicts better working conditions and enhances employees’ engagement because workers experience less demands, are less angry and depressed, and they also experience greater resources. Theoretically, the results imply that PSC is a precursor for working conditions that very much depends on senior managers who have the authority and discretion to design workplace tasks according to their values and priorities. Our results support extending work stress theory to include psychosocial safety climate to provide a more comprehensive understanding of health and positive work outcomes. The results are relevant for establishing some goals for the development of PSC for both health and productivity related outcomes.

**Limitations**

As in any research the study design has limitations. First, we cannot partition the variance in PSC due to individual or organizational effects. This is because the study uses a population based approach, rather than an organizational approach. The reason is that the study is part of a larger project on psychosocial risk factors at work in Malaysia, and because Malaysian employers are reluctant to engage their organizations in research in this area (Sohail, 2003). The scientific implication is that although we expect cross-level effects of PSC in the model to be consistent with the hypotheses as outlined, (PSC clustered at the organizational level predicting individual outcomes), the effect sizes would be smaller (see M. F. Dollard & Bakker, 2010), compared to the effects as currently
reported. This is because the effects currently combine both individual and group variance, that is, variance due to organization membership. Nevertheless participants were selected from each district of the state of Selangor, therefore the potential for them to come from the same organizations is very slim.

Second the results are cross-sectional and we cannot claim causal relationships. We did however rule out reversed effects models. Further some previous longitudinal research supports the proposition that PSC is a precursor rather than an outcome of work conditions (e.g., M. F. Dollard & Bakker, 2010). In addition we ruled out interpretation of results due to common method variance by conducting Harman’s one-factor test as in previous research (Bakker, Veldhoven, & Xanthopoulou, 2010). It is possible that the relationship could be due to third unmeasured variables. Further, given a lack of psychological research using longitudinal designs, particularly in the Asian region, the current research at least contributes to more understanding of PSC and the JD-R model within an Asian context. More important the research imposed an etic account of PSC theory in a completely different culture; in other words this preliminary evidence suggests the main propositions of the PSC theory hold across cultures. We also found that the model was invariant by employment sector.

Although the way the constructs related to each other was invariant cross-culturally a factor that may emerge as a point of difference is the development of occupational health and safety systems. It may be argued that as an emerging economy relevant occupational health and safety systems are nascent, relative to those one might expect in developed economies. The likely effect of this is that levels of PSC may be lower and working conditions worse than in developed economies (Ali, Abdullah, & Subramaniam, 2009). Further, cross-national research is needed to benchmark PSC and work conditions between the developed and developing countries, to investigate this issue further.

Third, the findings may depend on the job demands and job resources variables used in the current study. Other job demands and job resources variables could behave in different ways affecting the relationship between PSC and anger, depression, and engagement. It is important to note that we tried but could not use a psychological demand measure from the JCQ–2 due to its unreliability possibly due to difficulties the sample had in interpreting reverse items.

### Practical Implications

The development of PSC has implications for primary, secondary, and tertiary prevention/intervention for work stress. The relationship between PSC and work conditions (Idris et al., 2011), underscores the need for senior management to prioritize psychological health to be as important as production goals. This implication is consistent with the safety science literature that
finds leadership in particular, transformational leadership as a key factor for personal safety perceptions (Zohar & Tenne-Gazit, 2008). We see in this research that the PSC is a possible “cause-of-the-causes.” Practically, knowing if managers value the psychological well-being of workers may provide insights into the kinds of work conditions and worker emotions (i.e., anger, depression, engagement) that may result in the organization.

Therefore a central target to improve the working conditions is systems management and system design. Without a proper design and management of work systems, unhealthy work prevails, and leads to employee stress. We see PSC as a system generator and contend that enhancing PSC is practical solution to promote employees’ health, boost motivation, and increase organization effectiveness. Leadership training and development is required to help managers understand the work stress process and its implications for engagement and productivity. With this greater understanding, management commitment and actions to promote safety workplace may increase (Cox & Cox, 1991), along with a priority of regard for psychological health by management. This in turn will hopefully lead to actions such that workers are exposed to fewer job demands and increased job resources.

As a secondary intervention point, related research has underscored the social support potential of PSC as well, whereby PSC moderates the detrimental relationship between demands and negative emotions (M. F. Dollard & Bakker, 2010). As such a program within the workplace to enhance perceptions of PSC would be important (M. F. Dollard, in press). However perceptions will be commensurate with the actual implementation of policies, practices, and procedures for the protection and enhancement of psychological health. Participatory processes in the development of PSC, listening to contributions, risk assessment processes, and communication upward and downward have been suggested as useful process elements. Finally as a tertiary intervention point, policies, practices, and procedures could entail assistance once a worker becomes injured such as the provision of employee assistance programs, rehabilitation, and improved return to work processes.

CONCLUSIONS

In conclusion, we found the support for M. F. Dollard and Bakker (2010) that PSC augments the health erosion and motivational pathways of the JD-R framework. Moreover, we found empirically that PSC affects employees’ emotions other than burnout (as commonly proposed in JD-R theory). Although scholars agree employees’ engagement is a crucial part of work effectiveness (see Bakker & Leiter, 2010), we see that the effect of negative emotions could reduce the potential of job engagement. Anger and depres-
sion may reduce employee motivation to achieve the work goals. Because PSC is related to both job demands and job resources, managers and supervisors should focus on building PSC, which should result in increased work resources and reduction in exposure to job demands.

REFERENCES


**New Editors Appointed, 2013–2018**

The Publications and Communications Board of the American Psychological Association announces the appointment of 5 new editors for 6-year terms beginning in 2012. As of January 1, 2012, manuscripts should be directed as follows:

- **Journal of Experimental Psychology: Learning, Memory, and Cognition** (http://www.apa.org/pubs/journals/xlm/), Robert L. Greene, PhD, Department of Psychology, Case Western Reserve University
- **Professional Psychology: Research and Practice** (http://www.apa.org/pubs/journals/pro/), Ronald T. Brown, PhD, ABPP, Wayne State University
- **Psychology and Aging** (http://www.apa.org/pubs/journals/pag), Ulrich Mayr, PhD, Department of Psychology, University of Oregon
- **Psychology, Public Policy, and Law** (http://www.apa.org/pubs/journals/law/), Michael E. Lamb, PhD, University of Cambridge, United Kingdom
- **School Psychology Quarterly** (http://www.apa.org/pubs/journals/spq/), Shane R. Jimerson, PhD, University of California, Santa Barbara

**Electronic manuscript submission:** As of January 1, 2012, manuscripts should be submitted electronically to the new editors via the journal’s Manuscript Submission Portal (see the website listed above with each journal title).

Current editors Randi C. Martin, PhD, Michael C. Roberts, PhD, Paul Duberstein, PhD, Ronald Roesch, PhD, and Randy W. Kamphaus, PhD, will receive and consider new manuscripts through December 31, 2011.