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# Psychosocial safety climate as a lead indicator of workplace bullying and harassment, job resources, psychological health and employee engagement

Rebecca Law<sup>a</sup>, Maureen F. Dollard<sup>a,\*</sup>, Michelle R. Tuckey<sup>a</sup>, Christian Dormann<sup>b</sup>

<sup>a</sup> Work & Stress Research Group, Centre for Applied Psychological Research, School of Psychology, University of South Australia, Adelaide, South Australia, Australia

<sup>b</sup> Johannes Gutenberg-University, Mainz, Germany

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### ABSTRACT

Psychosocial safety climate (PSC) is defined as shared perceptions of organizational policies, practices and procedures for the protection of worker psychological health and safety, that stem largely from management practices. PSC theory extends the Job Demands–Resources (JD–R) framework and proposes that organizational level PSC determines work conditions and subsequently, psychological health problems and work engagement. Our sample was derived from the Australian Workplace Barometer project and comprised 30 organizations, and 220 employees. As expected, hierarchical linear modeling showed that organizational PSC was negatively associated with workplace bullying and harassment (demands) and in turn psychological health problems (health impairment path). PSC was also positively associated with work rewards (resources) and in turn work engagement (motivational path). Accordingly, we found that PSC triggered both the health impairment and motivational pathways, thus justifying extending the JD–R model in a multilevel way. Further we found that PSC, as an organization–based resource, moderated the positive relationship between bullying/harassment and psychological health problems, and the negative relationship between bullying/harassment and engagement. The findings provide evidence for a multilevel model of PSC as a lead indicator of workplace psychosocial hazards (high demands, low resources), psychological health and employee engagement, and as a potential moderator of psychosocial hazard effects. PSC is therefore an efficient target for primary and secondary intervention.

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## 1. Introduction

In many countries work stress is considered a preventable risk-assessable disease (Clarke and Cooper, 2000). Given the significant direct and indirect costs associated with it (Australian Safety and Compensation Council; ASCC, 2006), job stress is increasingly a national priority occupational health and safety (OHS) issue. Work stress results from prolonged exposure to workplace *psychosocial hazards* – aspects of the work environment, work design, and organizational management which potentially cause psychological and social harm (Cox et al., 2000). The “slow accident” effect of work stress, suggests that latent causes are readily identifiable (Clarke and Cooper, 2000). OHS legislation in countries such as Australia, Belgium, Denmark, the Netherlands, and Sweden specifies the need for employers to take action against psychosocial hazards (Ertel et al., 2008). In accord with the hierarchy of controls, the identification and management of more distal hazards and risks, so called ‘cause of the causes’, will provide a more reliable, efficient and effective control strategy (Dollard, 2011). In this paper we propose that psychosocial safety climate (PSC) is a distal upstream determinant of both hazards and job stress related outcomes.

Psychosocial safety climate is defined as “organizational policies, practices, and procedures for the protection of worker psychological health and safety” (Dollard and Bakker, 2010, p. 580). We propose that PSC is a lead indicator of commonly identified psychosocial hazards at work. In particular we focus on the work-related hazards (or demands) – harassment and bullying – as they comprise on average 24% of all accepted mental stress claims in Australia (2007–2008) (Productivity Commission, 2010). Our theoretical analysis brings together concepts from the safety science, work stress, and organizational psychology literatures, and poses PSC as an upstream antecedent to workplace psychosocial hazards in the form of (a) social and emotional demands (i.e., bullying and harassment) and (b) low job resources (i.e., supervisor support, job rewards, and procedural justice). We also explore the ameliorative effects of PSC as a moderator of the deleterious effects of job demands. The antecedent and ameliorative roles of PSC in this model, approximate the primary prevention, and secondary prevention roles of PSC respectively. Moreover, it is important that organizational performance and production goals are not neglected

Psychosocial safety climate is defined as “organizational policies, practices, and procedures for the protection of worker psychological health and safety” (Dollard and Bakker, 2010, p. 580). We propose that PSC is a lead indicator of commonly identified psychosocial hazards at work. In particular we focus on the work-related hazards (or demands) – harassment and bullying – as they comprise on average 24% of all accepted mental stress claims in Australia (2007–2008) (Productivity Commission, 2010). Our theoretical analysis brings together concepts from the safety science, work stress, and organizational psychology literatures, and poses PSC as an upstream antecedent to workplace psychosocial hazards in the form of (a) social and emotional demands (i.e., bullying and harassment) and (b) low job resources (i.e., supervisor support, job rewards, and procedural justice). We also explore the ameliorative effects of PSC as a moderator of the deleterious effects of job demands. The antecedent and ameliorative roles of PSC in this model, approximate the primary prevention, and secondary prevention roles of PSC respectively. Moreover, it is important that organizational performance and production goals are not neglected

\* Corresponding author. Tel.: +61 8 83022775; fax: +61 8 83022956.  
E-mail address: [Maureen.dollard@unisa.edu.au](mailto:Maureen.dollard@unisa.edu.au) (M.F. Dollard).

in the pursuit of health improvements. Therefore, we explore the role of PSC in stimulating psychological health in combination with work motivation outcomes.

1.1. Psychosocial safety climate

The conceptual theory of psychosocial safety climate draws upon perspectives from the work stress, psychosocial risk, and organizational climate literatures (Dollard, 2011). PSC is a facet-specific component of organizational climate relating to freedom from psychological harm at work (Dollard and Bakker, 2010). It reflects management commitment to workers' psychological health and the priority they give to safeguarding psychological health as opposed to production demands (Dollard and Bakker, 2010). Like organizational climate, PSC is conceived as a *property of the organization*, consisting of the aggregated perceptions of individuals within that organization regarding management commitment to protecting their psychological health and safety (Dollard and Bakker, 2010). The PSC construct stems largely from the idea that individuals ascribe meaning to their work environments – their working conditions, management systems, pay, co-worker relationships, and treatment equity (see James et al., 2008). As such, ways in which PSC can become visible to individuals include having well developed communication systems (e.g., for reporting poor psychological health at work) and actively involving all layers of the organization in work stress prevention (Dollard and Bakker, 2010).

The theoretical basis of psychosocial safety climate is similar to that of safety climate but focuses more sharply on psychosocial factors and psychological health. In its 30-year history, safety climate research has focused on accidents, errors, and disasters resulting in physical injury, and the high direct and indirect costs to personnel and industry in conditions where safety climate is poor (Neal and Griffin, 2006). Substantial evidence has been amassed linking safety climate to safety behavior and performance (Clarke, 2006; Flin et al., 2000; Zohar, 2010), physical injury (Silva et al., 2004; Zohar, 2010), and industrial accidents and errors (Hofmann and Stetzer, 1996; Neal and Griffin, 2006). Missing in the literature until recently has been the identification of a specific safety climate for *psychological* health and safety that may be a lead indicator of psychosocial hazards and psychological health at work.

Consistent with the safety climate literature, we propose that climate (i.e., PSC) precedes the conditions that lead to psychological injury. Applying safety science theory in a novel way, the likelihood of physical injury – and in addition *psychological* injury at work – may be conceived as the joint outcome of proximal factors, unsafe conditions (social/technical hazards), unsafe acts, cumulative exposure, and chance variations (Reason, 1997; Zohar, 2010). Thinking about our study in safety literature terms, exposure to bullying and harassment at work represents a hazard or unsafe condition, as are lack of supervisor support, inadequate job rewards, and low procedural justice. In the work stress literature, unsafe hazards may be understood as high job demands and low job resources (c.f. Zohar and Luria, 2005). Merging these perspectives forms the crux of the theory for PSC.

1.2. Psychosocial safety climate extending the Job Demands–Resources model

A basic premise in our PSC theory is that PSC, stemming largely from management practices regarding worker psychological health, acts as a precursor to psychosocial hazards – the (proximal) job demands and job resources experienced by workers. To build a model for our study we first turn to the Job Demands–Resources (JD-R) model of work stress (Demerouti et al., 2001), which describes how job demands and resources are linked

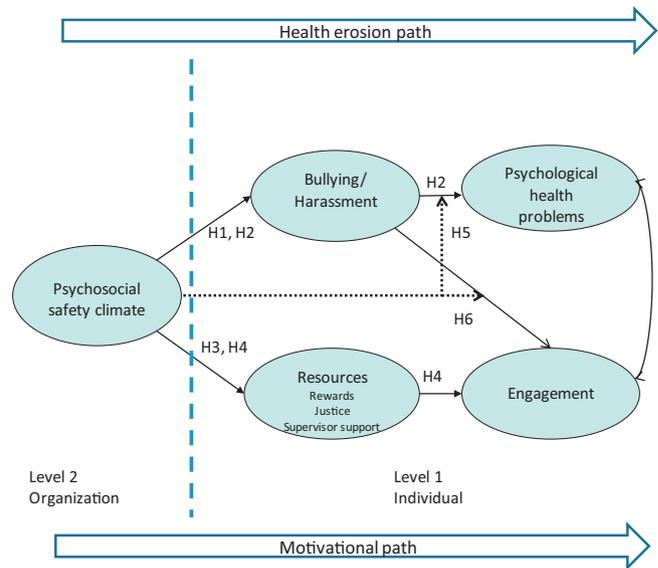


Fig. 1. Study model.

to work and health outcomes through two processes (Bakker and Demerouti, 2007; Hakanen et al., 2008b; see Fig. 1). The first is the *health impairment process* which explains how sustained effort to manage job demands contributes to strain through the exhaustion of energy reserves (Schaufeli and Bakker, 2004). Job demands are physical, social, or organizational aspects of the job that require sustained physical, psychological, cognitive, or emotional effort (Schaufeli and Bakker, 2004). Demands such as bullying and harassment are particularly stressful as they directly threaten the self (Semmer et al., 2005). Studies have consistently shown that a variety of job demands (e.g., emotional demands, work pressures) activate the health impairment process, leading to increased health problems such as psychological distress (Bakker et al., 2004; Dollard et al., 2007; Hakanen et al., 2006).

The second *motivational process* (see Fig. 1) describes the motivational potential of job resources to stimulate outcomes such as high work engagement and increased work performance (Bakker and Demerouti, 2007) extrinsically (by aiding goal attainment and reducing job demands), and intrinsically (by stimulating personal growth and learning) (Bakker et al., 2003). We argue that PSC functions as a reference point for the presence and level of psychosocial risks by *preceding* these two processes, thereby augmenting the JD-R framework (see also Dollard and Bakker, 2010; Idris et al., in press).

1.3. Health erosion pathway: workplace bullying and harassment

In our current PSC study model, job demands are operationalized by workplace bullying and harassment. Here, bullying is defined by three core features: duration (the offensive behaviors occur regularly and repeatedly over a period of six months), victimization (the victim experiences difficulties defending him or herself), and a power differential (the behaviors occur between two parties of disproportionate power) (see Lindström et al., 2000). Harassment is identified as perceived sexual harassment, discriminatory treatment, and psychological humiliation (Richman et al., 1996). Given the theoretical interrelations of these forms of victimization (Aquino and Lamertz, 2004; Bowling and Beehr, 2006), we envision similar antecedents and consequences. Exposure to these forms of workplace victimization carries high risk of harm for individuals, for example depression, anxiety, irritability (Mayhew and McCarthy, 2005), poor cardiovascular health (Tuckey et al.,

2010) and traumatic stress (Bond et al., 2010). Moreover, organizations suffer as a result of workplace victimization in terms of staff turnover, sickness absence, workers compensation, reduced morale and motivation, and diminished productivity (Hoel et al., 2003). Given these significant costs it is vital to understand the antecedents of bullying and harassment at work.

In organizations characterized by high levels of PSC, where worker psychological health and safety is protected, we expect that low levels of bullying and harassment will be observed. This relationship can be understood through the work environment hypothesis (Salin, 2003), whereby poor working environments create and sustain conditions that are conducive to bullying. If deviant behavior such as bullying and harassment goes unacknowledged and complaints are not acted upon (i.e., as could be expected when PSC is low), such behaviors effectively become “institutionalized” (Ashford, 1994; Liefoghe and Davey, 2001). In low PSC contexts, bullying may be perpetrated in a top-down fashion (e.g., in a pecking order of seniority in hierarchical cultures; Paice et al., 2004; Tuckey et al., 2009). By contrast, in high PSC contexts, top management assume responsibility for harassment and bullying (Heames and Harvey, 2006), through the enactment of relevant policies, practices and procedures. Therefore bullying and harassment may be deterred if top management adopts a zero-tolerance stance and, accordingly, the impetus for safeguarding employees from bullying and harassment flows primarily from senior management. Beginning with senior management priority and commitment to protect employees from psychosocial harm, organizational policies and procedures (in this case, PSC) operate in a multilevel top-down process, filtering down to lower levels where middle management and supervisors maintain and transmit these standards (Zohar and Luria, 2005). In support of the directionality of our theory, Bond et al. (2010) found that low PSC predicted workplace bullying in police officers over time, whereby high PSC was associated with lower bullying over time. Therefore, in line with the extended health erosion process of the JDR model we propose (see Fig. 1, the study model):

**Hypothesis 1.** Organizational PSC will be negatively related to workplace bullying and harassment.

**Hypothesis 2.** Organizational PSC will be negatively related to psychological health problems through its negative relationship with job demands (bullying and harassment). In other words, job demands will carry the effect of PSC onto psychological health problems in a mediated process.

#### 1.4. Motivational pathway: procedural fairness, organizational rewards and supervisor support

As mentioned, we believe that PSC should also relate to productivity and performance goals. To achieve organizational goals, employees should be provided with appropriate physical and psychosocial resources (Hobfoll, 1986). Within our extended JD-R model, the resources of interest are procedural fairness, organizational rewards, and supervisor support. Procedural justice refers to perceived fairness of procedural decisions, such as pay selection, performance evaluation, promotion (Lind and Tyler, 1988) and employee perceptions of how organizations allocate resources (Cohen-Charash and Spector, 2001). Supervisor support refers to employees' perceived social support from supervisors, including instrumental and emotional support. Organizational rewards relate to monetary, esteem, and status control (e.g., job security) (Siegrist, 1996).

The link between job resources and motivational outcomes can be explained by social exchange theory. According to this theory, workers who perceive or value their organization as being invested in their well-being, through adequate resource allocation,

are more likely to reciprocate through motivation and engagement at work (Blau, 1964; Maslach et al., 2001; Schaufeli and Bakker, 2004). Employees in effect “repay” the organization in response to resources received (Saks, 2006). Indeed, procedural justice has been linked to declines in job satisfaction (Folger and Konovsky, 1989), organizational commitment (Daly and Geyer, 1995), helpful citizenship behaviors (Moorman, 1991; Organ and Moorman, 1993), and job performance (Gilliland, 1994); supervisor support has been related to enhanced performance (Rhoades and Eisenberger, 2002; Viswesvaran et al., 1999); and rewards and supervisor support have been positively related to engagement (Demerouti et al., 2001).

In high PSC contexts, managers will be aware that workers require adequate resources to complete job tasks and will be cognizant that not having enough resources leads to reduced levels of positive work emotions (Schaufeli and Bakker, 2004). Within high PSC organizations we can expect higher procedural justice, greater supervisor support and greater rewards because the organization values the positive well-being of its workforce (i.e., levels of satisfaction, engagement) and thus creates optimum working conditions. Similarly, managers will understand that inadequate resourcing may lead to negative reactions and counterproductive consequences (Spector et al., 2006). In other words, PSC should be an indicator of adequate job resourcing within organizations, and associated individual level motivational processes that foster positive well-being outcomes. Previous research has found support for PSC activating the motivational pathway of the JD-R model; Dollard and Bakker (2010) and Idris et al. (in press) found that PSC predicted employee engagement through its relationship to a change in job resources. We therefore propose:

**Hypothesis 3.** Organizational PSC will be positively related to job resources (i.e., procedural justice, organizational rewards, and supervisor support).

**Hypothesis 4.** Organizational PSC has a positive effect on work engagement through its positive relationship with job resources; in other words, job resources will mediate the relationship between PSC and work engagement.

#### 1.5. Additional pathways: moderation effects of PSC

We also expect a safety signal effect whereby PSC provides information about possible resource options in the environment upon which employees can act to provide respite or relief from danger cues (Lohr et al., 2007). When danger cues such as workplace bullying and harassment are present, the PSC safety signal indicates action options (e.g., utilization of available emotional resources) to offset the aversive stimuli, and to avoid the development of psychological distress (see Lohr et al., 2007). In other words PSC represents a resource that can be used deal with demands. In relation to bullying and harassment, for example, when workers feel safe from harm due to a strong psychosocial safety climate, they know they will be supported to cope with any negative treatment they face and may not need to draw so heavily on their own resources to do so. Similarly, Bacharach and Bamberger (2007) found that the link between fire-fighter critical incident involvement and negative emotional states varied as a function of station/unit-level (rather than individual) job resources. Previous research showed unit-level PSC moderated the relationship between bullying/harassment and post-traumatic stress symptoms (Bond et al., 2010). This leads to the next hypothesis:

**Hypothesis 5.** Organizational PSC will moderate the relationship between bullying and harassment and psychological health problems. Under conditions of high PSC, the positive relationship between bullying/harassment and psychological health problems will be reduced. Conversely, in low PSC climates, reporting bullying

or harassment may lead to an exacerbation of the problem, due to victim blaming and scapegoating.

Additionally, there is an abundance of evidence on the negative affective-cognitive consequences of exposure to bullying and harassment, as noted above. As a result of the social and emotional effort required and the corresponding depletion of energy reserves, but more importantly, due to the direct threat to the self-associated with being victimized by bullying and harassment (Semmer et al., 2005), employee work engagement is likely to suffer. We propose, however, that PSC should mitigate this negative impact on engagement. PSC acts as an organization-based resource (Dollard and Bakker, 2010) that, over and above personal and job resources, can be harnessed to help affected workers cope with the social and emotional demands of bullying/harassment. Engagement particularly reflects how employees experience their work. When supported by a strong PSC to manage bullying/harassment demands, workers may thus still be able to experience their work as meaningful (dedication component of engagement), interesting (absorption), and something to which they wish to devote effort (vigor). In accordance we propose:

**Hypothesis 6.** Organizational PSC will moderate the negative relationship between bullying/harassment and engagement. That is, under conditions of high PSC the negative relationship between bullying/harassment and engagement will be reduced.

### 1.6. Level of operationalization

There is considerable confusion in the literature regarding whether the safety climate construct is a property of the organizational or the individual. Despite the term 'climate' implying shared perceptions that may reflect organizational or group features (Neal and Griffin, 2006), most studies operationalize climate at an individual level, and refer to this as the psychological climate (James et al., 2008). A recent review of 35 studies of the relationship between safety climate and safety performance showed that only 20% of studies used group level analysis (Clarke, 2006). Similarly Clarke's (2010) meta-analysis of the relationship between psychological climate, safety climate, and individual safety outcomes revealed only 7% of the studies used group level analysis. This issue is not specific to safety climate, as demonstrated in a recent meta-analysis of organizational climate research that had to be conducted at the individual level because of a low number of group level studies (Parker et al., 2003).

Psychosocial safety climate is mainly conceived as an attribute of the organization. It is theorized to vary across organizations because it is largely influenced by senior management, as is the case with safety climate (cf. Huang et al., 2007; Zohar and Luria, 2005). Senior management are responsible for creating PSC via executive decisions such as budgets, resource allocation, policies and procedures, and corporate priorities (e.g., the competing demands of productivity and profit versus stress prevention). To date, evidence for the PSC model is derived from the seminal work by Dollard and Bakker (2010) and Bond et al. (2010), using single occupational samples, where PSC is operationalized by aggregating individual perceptions about workgroup PSC to the workgroup level. In order to provide further support for the utility and pervasiveness of the model in this study we operationalized PSC as an organizational level phenomenon, and studied it across organizations.

## 2. Method

### 2.1. Participants and procedure

The sample consisted of Australian income earners from randomly selected households from the state of South Australia. Data

were collected from individuals in all sectors (private, government, non-government organizations) and professions within the workforce. Prospective participants were individuals in the household with a valid telephone connection, who most recently had their birthday within the household, between the ages of 18 and 65 years old, of paid employment, not self-employed, and agreed to provide information for the survey. Those who did not meet all of the above criteria were excluded from the study. A computer assisted telephone interviewing (CATI) technique was used. This technique was chosen in order to maximize response rates, minimize data collection time and errors, enable data collection from English as a second language participants, and to ensure a representative sample. An introductory letter was sent to potential participants' homes and 63.6% of those who responded to the telephone survey indicated that they had received the letter. The study had ethics approval from the University of South Australia Human Research Ethics Committee.

In total, there were 1134 participants who completed the Australian Workplace Barometer Questionnaire (AWBQ2009) via CATI (Dollard et al., 2009; Dollard and Skinner, 2007). The overall sample response rate was 31.2% and the participation rate was 38.4%. The data were weighted to the Australian Labour Force statistics (2006) released by Australian Bureau of Statistics in July 2007. The number of people not self-employed and in paid employment by age, group and sex was determined from these figures.<sup>1</sup>

Participants were asked to name the organization that they worked for;  $N=1043$ , 91.9% of participants provided employer details. We matched the data by employer, and selected participants from organizations for which we had at least four participants into the dataset. This resulted in a sample of 30 organizations (range 4–33 respondents,  $M=7.17$ ) with  $N=220$  in the final sample. The final sample was representative of the population by gender (males,  $N=99$ , 45%; females,  $N=117$ , 53.2%), Chi-square (1) = .36,  $p=.36$ . Most participants ( $N=146$ , 66.3%) were between 25–54 years of age; this age distribution was representative of the population, Chi-square (6) = 2.86,  $p=.83$ . The majority worked permanent full-time ( $N=113$ , 51.4%); 48 (21.8%) worked permanent part-time; 38 (17.6%) worked on a casual/temporary basis and 13 (5.9%) were on a fixed contract (other  $N=3$ , 1.4%). This result did not differ from the population, Chi-square (4) = 8.79,  $p=.07$ . There was a wide spread of industries in the sample, with the largest industries represented being education ( $N=59$ , 27%); government administration and defence ( $N=42$ , 19%); health and community services ( $N=38$ , 18%); and retail trade ( $N=29$ , 13.2%). Regarding size of organizations, 4 (2%) worked in a small organization (5–19); 10 (4.5%) worked in a medium organization (20–200); and 203 (92.3%) worked in a large organization (200+), with 3 (1.4%) responding "don't know"; Chi-square (3) = 54.12,  $p<.001$ . Not unexpectedly, our sample is more likely to represent larger organizations.

### 2.2. Design

The research design was a cross-sectional, non-experimental design, based on self-report data.

<sup>1</sup> Data were collected between June and August 2010 and weighted by age, sex and probability of selection for those aged 18 years and over in the household who worked in paid employment, but were not self-employed, to reflect the structure of those employed full or part time for an employer in SA. The sample weight is the inverse of that person's selection probability, and signifies the number of individuals in the target population that the sampled individual represents.

### 2.3. Measures

The measures used were drawn from the scales of the Australian Workplace Barometer (AWBQ2009) developed at the Centre of Applied Psychological Research, University of South Australia (Dollard et al., 2009).

*Controls* were age, gender, and income. We controlled for age and gender, and income as a proxy to socioeconomic status, as these variables may confound relationships between job characteristics and outcome variables (de Jonge et al., 1999; Karasek and Theorell, 1990).

*Psychosocial safety climate* was measured using a 12-item scale (Dollard and Kang, 2007; Hall et al., 2010). The measure contained four subscales, each with three items: *management commitment* (e.g., “Senior management acts decisively when a concern of an employees’ psychological status is raised”),  $\alpha = .91$ ; *management priority* (e.g., “Senior management considers employee psychological health to be as important as productivity”),  $\alpha = .90$ ; *organizational communication* (e.g., “There is good communication here about psychological safety issues which affect me”),  $\alpha = .76$ ; and *organizational participation* (e.g., “Employees are encouraged to become involved in psychological safety matters”),  $\alpha = .80$ . All items were measured on a 5-point Likert scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) and were added together to form a composite scale. High scores reflect high levels of PSC ( $\alpha = .94$ ). Both the 12-item scale ( $\alpha = .89$ ; Hall et al., 2010) and the abbreviated 4-item scale ( $\alpha = .91$ ; Dollard and Bakker, 2010) have shown good construct validity when assessed at the team level.

#### 2.3.1. Demands

*Organizational harassment* in the workplace was measured using seven items, based on the Richman et al. (1996) scale, canvassing harassment in the following areas: sexual, gender, racial or ethnic, being sworn at, being humiliated in front of others, and/or being physically assaulted/threatened. Items were measured using a 5-point Likert scale, ranging from 1 (*very rarely/never*) to 5 (*very often/always*),  $\alpha = .68$ .

*Workplace bullying* was measured using the following definition drawn from the General Nordic Questionnaire for Psychological and Social Factors at Work (QPSNordic) (Lindström et al., 2000): “Bullying is a problem at some work-places and for some workers. To label something as bullying, the offensive behavior has to occur repeatedly over a period of time, and the person confronted has to experience difficulties defending him or herself. The behavior is not bullying if two parties of approximate equal “strength” are in conflict of the conflict of incident is an isolated event”. Respondents were asked: “Have you been subjected to bullying at the workplace during the last 6 months?” answered with a yes–no response (*yes* = 1, *no* = 2).

We created a composite bullying/harassment measure by standardizing both scores and adding them together. The resultant measure was skewed (skewness = 1.79, S.E. = .17), so we added a constant and log transformed the measure, which reduced the skewness (skewness = 1.04, S.E. = .16). This improved homogeneity of variance in the Level 1 measure.

#### 2.3.2. Demand covariates

Our main focus was on bullying/harassment but we included demand covariates to underscore the importance of bullying/harassment over and above these measures. Scales were from the JCQ (Karasek et al., 1998): (1) *work pressure* was assessed by five items e.g., ‘My job requires working very hard’; (2) *physical demands* were assessed by five items e.g., ‘I am often required to lift heavy loads on my job’; (3) *work hours* were assessed as hours worked in the past 7 days; and (4) *emotional demands* was assessed using four items from the new Job Content Questionnaire 2.0 (JCQ

2.0; www.jcqcenter.org, 2009) with a sample question, “Does your work put you in emotionally disturbing situations?” All items were measured on a four point Likert scale, ranging from 1 (*strongly disagree*) to 4 (*strongly agree*).

#### 2.3.3. Resources

*Procedural justice* was measured by four items based on the JCQ 2.0. This measure tapped into the perceived fairness of the design and implementation of procedural decisions (e.g., “In my company/organization, procedures are designed to provide opportunities to appeal or challenge a decision”). The items were measured on a 4-point Likert scale, ranging from 1 (*strongly disagree*) to 4 (*strongly agree*);  $\alpha = .82$ .

*Social support – supervisor support* was measured by three items based on the JCQ 2.0 which comprised statements such as “My supervisor is helpful in getting the job done”. Items were measured on a 4-point Likert scale, ranging from 1 (*strongly disagree*) to 4 (*strongly agree*);  $\alpha = .83$ .

*Organizational rewards* were measured by four items derived from the Effort Reward Imbalance (ERI; Siegrist, 1996): “Considering all my efforts and achievements, I receive the respect and prestige I deserve at work”. Items were measured on a 4-point scale, ranging from 1 (*strongly disagree*) to 4 (*strongly agree*);  $\alpha = .65$ .

#### 2.3.4. Psychological health problems and work outcomes

*Psychological distress* was measured using the full 10 items from the Kessler 10 (K10; Kessler and Mroczek, 1994). The scale consists of questions on non-specific psychological distress, including the level of anxiety and depressive symptoms experienced in the most recent four-week period (e.g., “In the past 4 weeks, about how often did you feel nervous?”). Items were measured on a 5-point Likert scale, ranging from 1 (*none of the time*) to 5 (*all of the time*);  $\alpha = .84$ . We log 10 transformed this scale due to skewness.

*Emotional exhaustion* was measured using 5 items from the Maslach Burnout Inventory (MBI; Schaufeli et al., 1996). An example item is: “I feel emotionally drained from my work.” Items were measured on a 7-point Likert scale, ranging from 1 (*never*) to 7 (*always*);  $\alpha = .87$ .

*Engagement* was measured using the Utrecht Work Engagement Scale – Shortened Version (UWES-9; Schaufeli et al., 2006). There were three engagement subscales each with three items: *vigor* (e.g., “At my work, I feel bursting with energy”),  $\alpha = .73$ ; *dedication* (e.g., “I am enthusiastic about my work”),  $\alpha = .74$ ; and *absorption* (e.g., “I am immersed in my work”),  $\alpha = .64$ . We added all items together to form a composite scale. Items were measured on a 7-point Likert scale, ranging from 1 (*never*) to 7 (*every day*);  $\alpha = .84$ .

### 2.4. Data analysis

In order to assess common method variance, following Podsakoff and Organ (1986), we conducted Harman’s one factor test where all scale items were entered into an unrotated factor analysis. Ten factors with eigenvalues greater than 1 were extracted; the first accounted for 24.39% of the variance, and the next nine accounted for 33.83%, indicating that not a single factor, nor a general factor accounted for the majority of the covariance among the independent and criterion variables. Common method bias does not appear to be a serious problem in the study.

Given the multilevel nature of the data, we used hierarchical linear modeling (HLM) and the computer program HLM 6.06 (Raudenbush et al., 2005) to test all hypotheses. We standardized Level 1 variables across individuals, and standardized Level 2 variables across the 30 organizations (Mathieu and Taylor, 2007) to: (a) assist with comparison of measures that use different scales; and (b) to assist with the graphical interpretation of interactions.

To test for meso-mediation, which is concerned with cross-level prediction of intercepts, we followed Mathieu and Taylor's (2007) recommended steps. Preliminary steps required an assessment of the null model and relative magnitude and significance of variance (ANOVA) that resides within and between Level 2 units (organization) for each Level 1 variables, i.e., the ICC (1) (see Table 1).

To test mediation, step 1 required significant univariate cross-level X (independent measure PSC) → Y (outcome) relations (Table 2). Step 2 required significant effects of X → M (mediators) (Table 3). Step 3 required a significant M → Y relationship (Table 4) that persists even when X is added to the model (Step 4); if X adds no significant additional variance, this indicates full meditation. All of these steps were conducted as between-group analyses; upper level variables predicting the between-group variance in lower level measures (Zhang et al., 2009). We assessed mediation formally using the Monte Carlo method, appropriate for multilevel mediation (Bauer et al., 2006), by assessing the confidence intervals of the indirect effect (Selig and Preacher, 2008). All variables were group-mean centred.

To test moderation (Hypothesis 5), we used the following equation, controlling for age, gender, and income, predicting variation in the slope of bullying/harassment and psychological distress relationship by organizational levels of PSC:

$$\text{Level 1 : Psychological distress } T2 = \beta_0 + \beta_1 X \text{ Bullying/harassment} + r.$$

$$\text{Level 2 : } \begin{aligned} \beta_0 &= \gamma_{00} + \gamma_{01} X \text{ Psychosocial safety climate} + \mu_0. \\ \beta_1 &= \gamma_{10} + \gamma_{11} X \text{ Psychosocial safety climate} + \mu_1. \end{aligned}$$

Hypothesis 6 was tested similarly with engagement as the outcome.

### 2.5. Aggregation procedures

To assess PSC as a climate construct that is not held just in the eyes of the individual, we assessed whether PSC showed shared or group level effects within organizations. This was achieved by assessing: (1) sufficient between-group variance using the intra-class coefficient, ICC (1); (2) the homogeneity of the within-organization variance estimated using the mean  $r_{(WG)(j)}$  agreement index (James et al., 1984) – this is similar to other types of reliability coefficients such as the alpha coefficient and can be interpreted accordingly (de Jonge et al., 1999); and (3) the organizational level alpha (internal consistency) of the scale.

One-way random effects ANOVA,  $F(29, 189) = 1.74, p < .05$  showed significant between-group variance. The ICC (1) of PSC was .1185, indicating that around 12% of the variance in psychosocial safety climate could be explained by differences between organizations. An ICC (1) value of .12 is recommended in organizational research (James, 1982). The mean  $r_{(WG)(j)}$  agreement index was .90 (SD = .18), >.70 cut-off, representing sufficient homogeneity of psychosocial safety climate perceptions within organizations (Bliese, 2000). We assessed the organizational level PSC scale internal consistencies using the average item response per organization,  $\alpha = .95$ ; this was greater than the .70 threshold (Nunnally, 1978). Together these results justify aggregating PSC to the organizational level, and provide support for assuming it reflects properties of the organization.

## 3. Results

### 3.1. Data screening

Prior to analysis, all the measured variables were screened for accuracy of data entry, missing values, normality of sampling distributions, outliers (multivariate and univariate), linearity and multivariate normality. The dataset was screened for missing data

Table 1  
Means, standard deviations and correlations between model variables.

	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	F	ICC (1)
1. Age	41.02	12.89																2.02**	.1925
2. Gender			-.17*															3.40**	.2688
3. Income	5.44	2.26	.28**	-.36**														3.93**	.3390
4. Bullying and harassment	-0.03	1.49	.01	.16**	.00													1.81*	.1364
5. Work pressure	5.90	2.95	.01	.17*	.28**	.25**												1.33	.0908
6. Work hours	32.36	16.48	.17*	-.16*	.36**	.12	.09											2.75**	.1938
7. Physical demands	10.42	3.21	-.12	.07	-.30**	.14*	.15*	-.08										4.62**	.5195
8. Emotional demands	10.46	2.68	.19**	.28**	.19**	.27**	.55**	-.20**	.18**									4.28**	.3910
9. Procedural justice	11.16	1.75	-.00	-.12	.11	-.28**	-.28**	-.05	-.13	-.20**								2.02**	.1063
10. Organizational rewards	6.44	1.77	.08	-.03	.23**	-.14**	-.17*	.08	-.24**	-.09	.27**							1.28	.0662
11. Supervisor support	9.51	1.56	-.10	-.03	-.04	-.27**	-.28**	-.02	-.13	-.14*	.29**	.19**						2.21**	.2296
12. Psychosocial safety climate	41.79	10.37	-.15*	-.08	-.02	-.38**	-.38**	-.02	-.35**	-.39**	.61**	.42**	.40**					1.74*	.1185
13. Psychological distress	15.30	4.65	-.15*	.18*	-.04	.39**	.33**	.06	.18**	.28**	-.22**	-.29**	-.18**	-.26**				1.11	.0324
14. Emotional exhaustion	16.27	7.55	-.15*	.13	.13	.38**	.51**	.11	.12	.36**	-.23**	-.22**	-.15*	-.32**				0.91	.0316
15. Engagement	50.44	9.85	.14*	.00	.15*	-.18**	-.10	.13	-.21**	.07	.22**	.38**	.15*	.42**	-.34**			2.41**	.1616

Note: \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ . Above diagonal aggregate, below diagonal individual. Gender dichotomous. (N = 30 organizations, N = 220 individuals).

**Table 2**

Multilevel random coefficient model of PSC Level 2 predicting Level 1 dependent variables (between-group variance).

Between-group	Psychological distress			Emotional exhaustion			Engagement		
	B	S.E.	t	B	S.E.	t	B	S.E.	t
Psychosocial safety climate	-.13	.07	-1.09 <sup>^</sup>	-.11	.05	-2.11*	.26	.10	2.25*
2 × log likelihood deviance (parameters)		586.00 (7)			599.38 (7)			583.99 (7)	
Δ Chi-square (d.f.)		2.72 (1) <sup>^</sup>			1.76 (1), p = .18			8.40 (1)**	

Notes: <sup>^</sup>p < .05 (1-tailed); \*p < .05; \*\*p < .01; each analysis controls for age, gender, and income; 2 × log likelihood deviance of final model; Δ Chi-square significance of change in deviance adding PSC.

**Table 3**

Multilevel random coefficient model of PSC Level 2 predicting Level 1 mediator variables (between-group variance).

Between-group	Bullying/harassment			Supervisor support			Procedural justice			Rewards		
	B	S.E.	t	B	S.E.	t	B	S.E.	t	B	S.E.	t
Psychosocial safety climate	-.25	.06	-3.51**	.22	.05	3.90**	.29	.09	3.09**	.16	.09	1.99 <sup>^</sup>
2 × log likelihood deviance (parameters)		586.12 (7)			573.39 (7)			585.72 (7)			602.65 (7)	
Δ Chi-square (d.f.)		8.40 (1)**			8.62 (1)**			9.18 (1)**			3.91 (1)*	

Notes: <sup>^</sup>p < .05 (1-tailed); \*p < .05; \*\*p < .01; each analysis controls for age, gender, and income; 2 × log likelihood deviance of final model; Δ Chi-square significance of change in deviance adding PSC.

using the Missing Value Analysis function in SPSS. Next, the pattern of missing data was observed; with Little's MCAR test, indicating that data was missing completely at random (Field, 2009). When few data points are missing in a random pattern, from a large dataset (approximately < 5%), "almost any procedure for handling missing values yields similar results" (Tabachnick and Fidell, 2007, p. 63). Hence, all measured variables with missing values less than 5% (in this case, all of them) were replaced by the mean. Normality of the sampling distributions was observed using Q-Q plots (Field, 2009).

### 3.2. Descriptives

The prevalence of bullying observed in the sample was 8.8% (N = 19 of 215). The means, standard deviations, and correlations between all variables are displayed in Table 1.

### 3.3. Hypothesis testing

First we estimated a null or baseline model using ANOVA to determine if sufficient variance existed to warrant examination of between organizational predictors on lower-level mediators or the criterion. As shown in Table 2, the F value for the mediator bullying/harassment was significant  $F(29, 185) = 1.81, p < .01$ , and the ICC (1) was .1364, indicating that 13.64% of the variance in bullying/harassment was due to organizational factors. The F value was significant for the resource measures (procedural justice, supervisor support), and was greater than 1 for rewards, justifying the investigation of organizational level influences. For the criterion measure engagement, the F value was significant and 16% of the

variance in engagement was due to organizational factors. The two outcome measures emotional exhaustion and psychological distress showed insignificant ICC values, with just over 3% of the variance due to organizations. Some researchers warn against using a low ICC value to assume no group dependence in the observations. They argue that a low ICC value does not imply that the independence of observations has not been violated (Roberts, 2007), and demonstrate that "the degree of observational dependence is determined by the nature of the covariates/predictors chosen to be included in the model" (p. 3). Adding the covariates to the model also recommended by Mathieu and Taylor (2007) increased the ICC of emotional exhaustion to 7% but there was no improvement for psychological distress. Although between-organization variation in the outcomes was low, we continued with the HLM model as this model was the appropriate method for testing our *a priori* hypotheses (and despite the low variation, which should make it more difficult to detect associations, group level effects were found).

In support of Hypothesis 1, that PSC would be negatively related to bully/harassment, we found that organizational PSC added significant variance to the null model with the covariates age, gender and income in the model,  $\Delta\chi^2(1 \text{ d.f.}) = 8.40, p < .01$  (see Table 3). After controlling for age, gender and income the relationship between organizational PSC and bullying/harassment was negative and significant,  $B = -.25, S.E. = .06, t = -3.51, p < .01$ . This is evidence in support of Hypothesis 1.

In relation to Hypothesis 2, that PSC is related to psychological health problems via bullying/harassment for step 1, we regressed the health outcome on organizational PSC with covariates age, gender, and income in the model and found a significant negative relationship of PSC with psychological distress,  $B = -.13, S.E. = .07$ ,

**Table 4**

Multilevel random coefficient model regressing psychological health problems, and work engagement on work conditions (between-group variance).

Between-group	Psychological distress <sup>#</sup>			Exhaustion <sup>#</sup>			Engagement <sup>###</sup>		
	B	S.E.	t	B	S.E.	t	B	S.E.	t
Intercept	-.05	.05	-1.00	-.05	.05	-.96	-.02	.07	-.27
Psychosocial safety climate	-.03	.07	-.46	.00	.07	.98	.18	.09	1.92
Bullying/harassment	.20	.09	2.28*	.17	.07	2.27*			
Rewards							.20	.10	2.09*
2 × log likelihood deviance (parameters)		559.05 (12)			592.02 (12)			581.75 (8)	
Δ Chi-square (d.f.)		7.47 (1)**			3.18 (1) <sup>^</sup>			14.01 (1)**	

Notes: <sup>^</sup>p < .10; \*p < .05; \*\*p < .01; \*\*\*p < .001; 2 × log likelihood deviance of final model. <sup>#</sup>, controls for physical demands, emotional demands, work pressure, work hours, age, gender, and income, <sup>###</sup>, controls for age, gender and income; Δ Chi-square significance of change in deviance when adding bullying/harassment to controls for psychological health problems, and rewards to controls in the case of engagement.

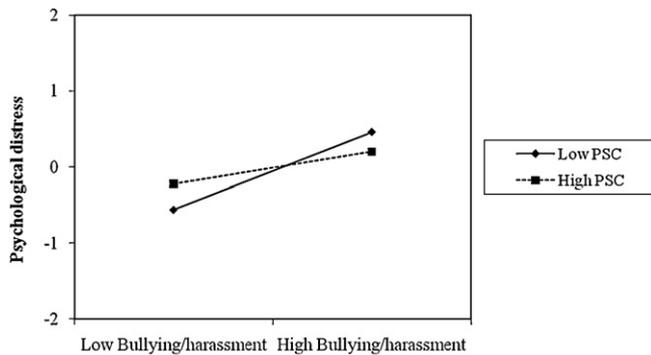


Fig. 2. PSC moderates the relationship between bullying/harassment and distress.

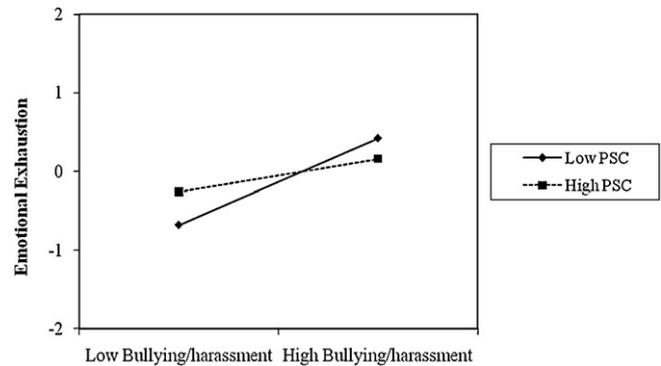


Fig. 3. PSC moderates the relationship between bullying/harassment and emotional exhaustion.

$p < .05$  (1-tailed), and with exhaustion  $B = -.11$ ,  $S.E. = .05$ ,  $p < .05$ . Step 1 was supported.

Step 2 was supported as in Hypothesis 1.

Next we assessed steps 3 and 4 together in one analysis. As shown in Table 4, adding bullying/harassment to the control measures resulted in a significant Chi-square change for both distress and exhaustion. Even after considering a range of demand covariates, the relationship between bullying/harassment was significant and positively related to psychological distress,  $B = .20$ ,  $S.E. = .09$ ,  $t = 2.28$ ,  $p < .05$  and emotional exhaustion,  $B = .17$ ,  $S.E. = .07$ ,  $t = 2.27$ ,  $p < .05$ . Further PSC was not significant in the final models. Using *between-group* variance estimates, the indirect effect via bullying/harassment was significant for psychological distress,  $B = -.05$ , as indicated using the Monte Carlo method to determine the confidence interval (C.I.), 95% C.I. = lower level (LL)  $-.11$ , to upper level (UL)  $-.01$ , and for emotional exhaustion,  $B = -.04$ , 95% C.I. = LL  $-.08$ , to UL  $-.01$  respectively. Using the above steps, there were no mediation effects involving the demand covariates after accounting for bullying/harassment. This is strong support for Hypothesis 2.

In relation to Hypothesis 3, that PSC would be positively related to job resources, as shown in Table 3, we found that PSC added significant variance to a null model with the demographic covariates, with supervisor support,  $\Delta\chi^2$  (1 d.f.) = 8.62,  $p < .01$ ; procedural justice,  $\Delta\chi^2$  (1 d.f.) = 9.18,  $p < .01$ ; and job rewards  $\Delta\chi^2$  (1 d.f.) = 3.91,  $p < .05$ . Overall, this provides support for Hypothesis 3.

In relation to the mediation Hypothesis 4, that PSC would be related to engagement via job resources, step 1 showed that PSC was significantly positively related to engagement,  $B = .26$ ,  $S.E. = .10$ ,  $t = 2.25$ ,  $p < .05$  (see Table 3). In step 2 of the analysis as outlined above, PSC was related to all resources (see Table 2). For steps 3 and 4 we found that when resources were added to the control model simultaneously only rewards approached significant ( $p = .05$ ). Added alone, the Chi-square change was significant. We therefore only considered this variable in step 4 along with PSC. Rewards remained significantly associated with engagement with PSC in the model, consistent with a mediation effect  $B = .20$ ,

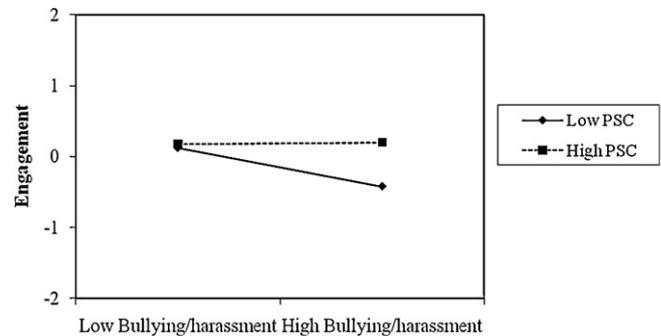


Fig. 4. PSC moderates the relationship between bullying/harassment and engagement.

$S.E. = .10$ ,  $t = 2.09$ ,  $p < .05$  (see Table 4), and the indirect effect was significant  $B = .03$ , 90% C.I. = LL  $.00$ , to UL  $.07$ . Hypothesis 4 is supported but only for rewards.

Hypothesis 5 concerned the moderation effects of PSC on the relationship between bullying/harassment and psychological health problems. As shown in Table 5, after accounting for control variables and main effects, we found that the interaction between organizational PSC Level 2 and bullying/harassment Level 1 was significant and added significant variance to the model. As shown in Figs. 2 and 3, the strength of positive relationship (slope) between bullying/harassment and psychological distress and emotional exhaustion varied between organizations, and was reduced under conditions of high organizational PSC. In sum there was significant support for Hypothesis 5.

Hypothesis 6 predicted that PSC would act as a buffer in the relationship between bullying/harassment and engagement. As expected (see Fig. 4), as bullying/harassment increases, work engagement decreases when PSC is low. However when PSC is high, the relationship does not exist.

Table 5  
Multilevel random coefficient model of main and interaction effects of organizational PSC and bullying/harassment.

	Psychological distress			Emotional exhaustion			Engagement		
	B	S.E.	t	B	S.E.	t	B	S.E.	t
Intercept	-.11	.06	-1.96*	-.09	.06	-1.57	.02	.07	.31
Organizational PSC	.02	.08	.21	.04	.06	.76	.17	.09	1.84
Bullying/harassment	.36	.08	4.20***	.38	.05	7.40***	-.13	.07	-1.82
Org PSC × bullying/harassment	-.15	.07	-2.10*	-.17	.04	-4.06***	.14	.07	2.19*
2 × log likelihood deviance (parameters)		555.45 (9)			564.19 (9)			577.68 (9)	
Δ Chi-square (d.f.)		5.47 (1)*			7.61 (1)**			5.01 (1)*	

Notes: \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ ; PSC level 2, Bullying/harassment and outcomes, Level 1; 2 × log likelihood deviance of final model. Δ Chi-square significance of change in deviance when adding the interaction terms; Org, organizational; each model controls for age, gender and income.

#### 4. Discussion

The current study is the first to operationalize PSC at an organizational level and provides evidence that organizational PSC is a lead indicator of psychosocial risks at work. We found that in organizations with low PSC, workers reported more workplace bullying and harassment, and fewer resources (less supervisor support, procedural justice and job rewards). We found that PSC triggered both the health impairment and motivational pathways specified in the extended JD-R model. Bullying/harassment proved to be the most important factor linking PSC to psychological health problems. This relationship was strong and held even after controlling for a range of other demand measures including psychological, emotional, and physical demands, working hours, and socioeconomic status.

The PSC → bullying/harassment → psychological health problem relationship was consistent with our proposal to extend the health impairment pathway of the JD-R model. Consistent with the extended motivational pathway of the JD-R model, PSC was associated with engagement via its effect on rewards. Further we found that PSC, as an organization-based resource, moderated the positive relationship between bullying/harassment and psychological health problems, and the negative relationship between bullying/harassment and engagement.

These findings add to a growing body of empirical evidence strengthening the theory of PSC and its proposed status as an upstream determinant or lead indicator of psychosocial risks, and in turn worker health and work motivational outcomes (Dollard, 2011). In particular, we add to the Dollard and Bakker (2010) study that found that PSC was related to change in both job demands and resources overtime, and that work conditions respectively mediated the relationship between PSC and psychological health problems and work engagement. Specifically in Dollard and Bakker's (2010) study, job demands were operationalized in terms of work pressure and emotional demands. Our study showed that over and above these effects, workplace bullying and harassment carried the effect of PSC on psychological health outcomes. Additionally Dollard and Bakker operationalized job resources in terms of job control (skill discretion and job authority); in the current study, we found additional support for the extended motivational hypothesis with resources operationalized in terms of rewards. Salanova et al. (2010) suggest that in reality resources do not exist in isolation but are linked together. Gain spirals are created by such "resource caravans", whereby those who possess a greater number of resources experience gains in other aspects within the work dimension (Hakanen et al., 2008a). Together the evidence suggests that theoretically PSC may trigger a positive resource gain spiral, which underpins the mediation observed in PSC studies.

Importantly, we found a significant relationship between Level 2 PSC and bullying/harassment, and further tests showed this was over and above the effects due to individual level PSC. This illustrates that reports of bullying and harassment cannot be dismissed as purely subjective as they are predicted from group PSC responses better than they are from self-reports of PSC. To reiterate we can predict reports of bullying/harassment from knowing about organizational levels of PSC.

Finally, our research supports the idea of PSC as an organizational resource that interacts with hazards to reduce their impact on psychological health outcomes. This result is consistent with Bond et al. (2010) who reported unit PSC as a moderator of bullying on post-traumatic stress disorder in police officers. It also accords with Bacharach and Bamberger (2007) finding that unit-level resource adequacy moderates the relationship between involvement in critical incidents and distress. Uniquely, we found that PSC can also protect against the erosion of the positive cognitive-affective experience of work (i.e. engagement) that might

otherwise result from exposure to psychosocial hazards like bullying and harassment.

The theoretical implications of these results are that current work stress theories require extension to include PSC as a multilevel antecedent or possible 'cause of the causes' of work conditions, and as a multilevel moderator of hazardous work conditions (Dollard, 2011). We propose theoretical revisions more specifically in relation to bullying where PSC is an antecedent to bullying/harassment and resources, and as a moderator of bullying (and other demands) at work. The results support the need for multilevel theory to guide work stress research and intervention.

##### 4.1. Strengths, limitations and future research

One of the strengths of the study is that we matched the level of measurement of PSC to the theoretical level of PSC as a property of the organization via aggregation of climate perceptions from individuals to the organizational level. As noted, many previous studies of organizational climate have not been able to achieve this. Further, this is the first study to operationalize PSC at an organizational level, and to explore organizational differences in PSC and its effects on lower level entities.

In the study we were able to observe organizational PSC effects within a sample derived from population based sampling. This sampling technique has the advantage of potentially drawing an unbiased sample of all employees because organizations do not have the power to veto the participation of their employees. The fact that we observed PSC effects between organizations represented in this sample is probably remarkable, since employees within an organization cluster could vary by location, occupation and team, thus rendering the commonality within organizations much less than in other sampling designs without these variations. Further we overcame possible socioeconomic effects by controlling for income level.

We had success in exploring group level effects on engagement because there was sufficient variance due to organizational level factors to warrant examination. Organizational engagement may be indicated in organizations with high levels of PSC. In relation to the psychological health problem measures, the variance due to organizational level factors was very small (from 3% to 7%). Even so we still found cross-level effects mediation and moderation effects. We believe that the effect would be larger with a greater number of organizations, and with a larger number of participants per organization. Future research within organizations could decompose effects due to the organization and the team.

There are several limitations associated with the current study. Firstly, the study is cross-sectional, therefore there are limitations in terms of ruling out the effect of unmeasured extraneous variables, inferring causality, and ruling out reverse causality (e.g., that the individual's experience of work and health outcomes or demands and resources influences the perception of organization PSC). However, previous studies (e.g., Dollard and Bakker, 2010) have found an effect of PSC on work conditions longitudinally, giving weight to causal inferences, and the directionality of our hypotheses. Nevertheless it is pertinent to acknowledge that the results of the study do not infer causality but are simply consistent with PSC as a precursor to the JD-R model. Secondly, common method variance may be an issue with self-report measures (Podsakoff et al., 2003), where factors such as personality and negative affectivity may give rise to inflated associations (Niedhammer et al., 2008). If common method variance was a problem, variables in the correlation matrix would be almost equally related (Moliner et al., 2008), which was not the case. Additionally we expect common method variance is not a serious threat given the results of the Harman test and since interaction effects are observed. Since we were estimating between-group variance,

rather than within-group variance, common method variance is not likely to be an issue.

As with all self-report data, there may have been issues with self-reporting bias, especially in terms of self-reported health outcomes, although it has been noted that self-reported health is a reliable indicator of health when compared to morbidity and mortality (Idler and Benyamini, 1997; Kaplan et al., 1996; Miilunpalo et al., 1997). In order to address the problems associated with common method variance and subjective bias, future studies could use non-self-report measures or triangulate evidence from a variety of sources (e.g., work stress compensation claims, focus groups, situational audits, hospital records); clearly there were challenges in using multiple data sources in a population based study. Future studies could also differentiate between permanent and temporary employees; Luria and Yagil (2010) found that permanent employees viewed organizational and group levels as the significant referents for safety perceptions, compared to temporary employees who perceived safety referents from an individual level.

#### 4.2. Practical implications

We theorized and found support for PSC as a target for both primary and secondary prevention in the job stress process. PSC is social determinant of the work context, in particular bullying and harassment, and several important resources. Given that several studies support the epidemiological link between workplace bullying/harassment behaviors, resources and negative health and work outcomes (e.g., Mikkelsen and Einarsen, 2001; Niedhammer et al., 2008; Zapf et al., 1996), focusing on building PSC should provide far reaching positive primary prevention consequences. In addition, PSC shows secondary prevention functions by moderating the negative effects of psychosocial hazards.

PSC theory therefore provides a new multilevel framework for organizational change. PSC itself represents actions required under OHS duty of care obligations to reduce foreseeable risk to psychological and emotional injury. This indicates that effective interventions are required at the organizational level via change in management practices, priorities and values, supervisory practices, production methods and human resource policies (Dollard, 2011; Dollard and Karasek, 2010; Sauter et al., 2002).

A number of stakeholders should be concerned with managing and establishing PSC, including managers, unions, OHS experts and organizations, researchers and state and federal governments. Managers should invest resources in developing, implementing and maintaining policies, practices and procedures that protect worker psychological health and safety. Examples include developing adequate policies, and reporting systems for workplace bullying and implementing procedures to deal with complaints in a timely fashion. Further conceptual work and refinement to PSC theory, development and testing of prevention programs are needed before national standards for PSC can be established. However, the theory of PSC provides a starting point for organizational priority setting to prevent psychosocial hazards at work known to lead to psychological health problems. On another level, such research challenges the orthodoxy of responsibility for monitoring and managing psychological health by the individual and suggests that an organizational response may be more effective and efficient.

Economically, the case for building PSC is pressing given that mental stress workers compensation claims recorded the highest median time lost (working weeks) and median payments of all claim types categorized by mechanism of injury or disease in Australia during 2005–2006 (ASCC, 2009). In terms of workplace bullying, the high representation of bullying in workers compensation claims, and the costs associated with claims, absenteeism, productivity loss, and staff turnover, provide ample motivation for organizations to target upstream determinants of these behaviors.

Thus, the current study identifies a multilevel change agenda to target the true sources of work stress by particularly focusing on organizational level PSC, and workplace bullying and harassment. Such a paradigm is in line with the trend towards organizational-level work stress interventions (Cox et al., 2007) and the view that long term sustainable change is observed in organizations when interventions adopt a broader systems level approach. Building PSC as a continuous organizational development strategy should also provide a positive context for future stress intervention strategies as well (Dollard, 2011).

#### 5. Conclusion

In conclusion, the current study provides further support for a multilevel theoretical model of PSC – a relatively new and emerging construct in the occupational health and safety literature. PSC is a lead indicator of psychosocial hazards, psychological health problems and work engagement. The impetus to set the standard for PSC lies with top management, and it is mutually beneficial for a number of stakeholders to monitor, address and evaluate PSC within organizations and across industries. Projecting further into the future, interventions aimed at monitoring and changing PSC should be developed and evaluated.

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