Psychosocial Safety Climate and Occupational Health

21

What We Know So Far

May Young Loh, Amy Zadow, and Maureen Dollard

Contents

M. Y. Loh (✉) · A. Zadow · M. Dollard
Asia Pacific Centre for Work Health and Safety, Centre for Workplace Excellence, University of South Australia, Adelaide, SA, Australia
e-mail: may_young.loh@mymail.unisa.edu.au; amy.zadow@unisa.edu.au; Maureen.Dollard@unisa.edu.au

T. Theorell (ed.), *Handbook of Socioeconomic Determinants of Occupational Health*, Handbook Series in Occupational Health Sciences,
https://doi.org/10.1007/978-3-030-31438-5_17

Abstract

Psychosocial safety climate (PSC) is a facet-specific organizational climate that relates to employee psychological safety and health. Since the proposal of PSC over 10 years ago, PSC has received significant attention from researchers interested in the effect of the meso-level organizational context and its relationship with occupational health and safety. The theory of PSC is an emergent phenomenon which proposes that organizations differ in terms of their prioritization of psychological aspects of individual's well-being over productivity imperatives. Empirical evidence relating to PSC theory has largely supported the notion that PSC is a lead indicator of workplace psychological health and safety, largely through its influence on the job design and socio-relational aspects of the work environment. To date, more than 62 research outputs, including books, journal articles, book chapters, and industry reports, have been published in relation to PSC theory and its negative relationship with occupational health issues using qualitative, quantitative, and meta-analytic research designs. However despite substantial evidence outlining the preeminent role of PSC as a predictor of psychosocial workplace factors, several questions remain to be answered. This chapter summarizes the propositions of PSC theory and empirical evidence relating to PSC to date. It provides an overview about what is known in the PSC literature and suggests further areas for exploration to expand on our understanding of the influence of meso-level PSC measured at the organizational and group level as a cause of the workplace conditions that affect workplace psychological health.

Keywords

Psychosocial safety climate · Occupational health · Psychological health · Organizational intervention · Employee well-being · Work stress

Introduction

The Global Commission on the Future of Work 2019 proposes **a human-centered agenda for the future of work** by "placing people and the work they do at the centre of economic and social policy and business practice" (International Labour Organization 2019). In line with this, psychosocial safety climate (PSC) theory is proposed as an organizational value and structural framework that promotes decent work and prevents the development of the adverse work conditions that impact employee psychological health and well-being within workplaces. PSC is a domain-specific aspect of organizational climate related to the organizational priorities articulated and demonstrated in relation to employees' psychological health and safety at work

(Dollard and Bakker 2010). Identifying, measuring, and cultivating domain-specific organizational climates are important because evidence demonstrates that they influence behavior and health within organizations (Schneider et al. 2017). In short, employers who exhibit high concern about employees' psychological health are expected to develop and implement rules and regulations that balance the imperatives between productivity and employees' well-being. Hence, PSC is a fundamental element preceding the design of a psychologically safe workplace.

In comparison with traditional ideas about work stress that emphasize personal responsibility and individual coping strategies, PSC is derived from a notion that occupational health and safety is a product of the multilevel nature of organizations (Zadow and Dollard 2016; Hofmann et al. 2017). PSC researchers argue that the hierarchical nature of team, departments, and organizations influence the occurrence of stress through the way top management decide, assign, and set goals and job tasks. These decisions directly affect the level of workplace psychosocial hazards affecting workers such as work overload, job insecurity, tight working deadlines, extensive learning demands, and long working hours, in turn leading to poor psychological health. Aligned with the aim of the current handbook in exploring the multilevel influences on occupational health, the focus of discussion in this chapter will be on the meso-level influence of PSC, at the organization and team level, and this level of influence on individual occupational health outcomes. Although several papers measuring PSC at the individual level have found that high individual PSC is related to better individual health and more engaged working lives (Bailey et al. 2015a; Dollard et al. 2017), this chapter focuses on how PSC is conceptualized as a multilevel phenomenon, playing a role at the sociopolitical (macro-), organizational, and team (meso-)level, as a predictor of worker health and productivity outcomes. This chapter aims to outline PSC as a multilevel work stress theory and review the evidence supporting the PSC theoretical framework that has been established in the literature to date. At the end of this chapter, several suggestions and recommendations for the future investigation of PSC are canvassed.

While research investigating the PSC framework has specifically focused on PSC as a lead indicator that predicts workplace psychological health, engagement, and productivity, through the promotion of healthy psychosocial job design, the specific focus of PSC studies varies. A systematic review completed by Yulita et al. (2016) identified that 70% of PSC studies between 2010 and 2016 investigated the relationship between PSC and psychological health outcomes, focusing on emotional exhaustion (i.e., a core component of burnout), psychological distress, or depression. Physical health outcomes have also been investigated in PSC research including musculoskeletal pain, work injuries, and workers' compensation claims for physical complaints. Nonetheless, the development of PSC theory has received substantial amount of attention since then. In March 2019, 22 studies on PSC were identified using Google Scholar specifying a 2018 publication date using the keyword of "psychosocial safety climate." It is clear that PSC publications are growing since its introduction of PSC in year 2007 (see Fig. 1). Recent studies have extended PSC theory to individual needs, interventions, and cardiovascular disease.

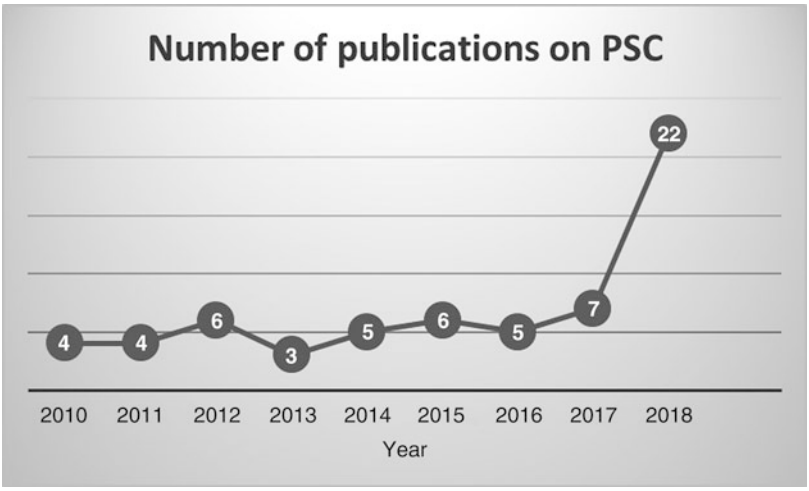

Fig. 1 Number of publications on PSC between year 2010 and 2018

Why "Psychosocial" Safety Climate?

An important issue identified in the work health and safety literature is the articulation and measurement of the root cause of adverse employee safety outcomes. The occupational health literature initially focused on the individual causes of poor safety outcomes (e.g., individual safety behavior, motivation, and knowledge). Then several scholars suggested that safety within an organization is closely associated with its context, such as the climate of the organization. Organizational climate reflects on what employees perceive is valued and rewarded in an organization or team (Cox and Flin 1998; Zohar 1980). The notion of safety climate as a root cause evolved following incidents such as the Chernobyl nuclear explosion in 1986 that was attributed to the perceptions of employees that safety was not prioritized, leading to a range of emerging problems such as insufficient training and staffing to maintain the safety of the plant. The lesson learned from these events was that individual safety rules and regulations are not enough to ensure occupational safety, when there is a competing perception that safety is not a priority. Hence, the idea of safety climate was developed and has been proposed as a critical predictor for workplace safety (Hofmann et al. 2017). Undeniably, safety climate research has successfully helped improve employees' health and safety for years, with research evidence demonstrating that a strong safety climate reduces the occurrence of workplace accidents and injuries and promotes safety behaviors (Jiang et al. 2019). However, coming into the new millennium, the nature of work has changed with the advent of technology, increasing pressure for productivity, profits, and growth, creating different demands (Korunka and Kubicek 2017), and leading to higher rates of workplace stress.

At the turn of the century, the leading theories of work stress were largely limited to proximal predictors of workplace stress such as job design (e.g., the job characteristics theory [JCT; Hackman and Oldham 1976], the job demands-control model [JDC; Karasek 1979], etc.). These established theoretical models have led the literature in work stress and other psychological health issues. Their main tenet is that the working conditions, which consist of both positive and negative job design, affect psychological health. On one hand, positive job design reduces the likelihood of psychological strains; on the other hand, negative job design would lead to the onset of psychological health problems (Bakker and Demerouti 2016; Lesener et al. 2019). Although this provides some initial understanding on how working conditions affect individuals, the design of a job is arguably driven from a higher level of influence, such as the organizational context (Parker et al. 2017), leading to a need for further investigation upstream.

One of most important concepts in the occupational safety literature is the role of the safety climate as a higher level influence affecting individual conditions in the workplace that impact safety outcomes (Hofmann et al. 2017). However, before the new century, studies of the safety climate in relation to occupational health were mainly focused on the physical safety features but neglected what has been called the psychological perspective. As noted by Zadow and Dollard (2016), there are two streams of inquiries in relation to occupational safety and health: (1) the work stress literature focusing on proximal and individual factors and (2) the occupational safety studies focusing on organizational climate and physical safety issues. The lack of convergence between these two areas inspired the development of a new work stress theory, that is, the psychosocial safety climate (PSC).

PSC Definitions and Domain

By definition, PSC is the shared perception of employees toward the organizational "policies, practices and procedures for the protection of worker psychological health and safety" (Dollard and Bakker 2010). This definition is derived from the traditional concept of organizational climate which have been proposed for nearly half of a century (Schneider et al. 2017; Schneider and Reichers 1983). Scholars argued that the early work on organizational climate focusing on the molar idea of organizational climate as a precipitator of a wide range of employee outcomes lacked specificity. They argued that it would be more effective to measure and promote specific climates for specific outcomes of interest, for example, safety climate to prevent occupational injuries. It was proposed that aspects of an organizational climate would have specific relationships that are directly aligned with the outcomes of interest and that these aspects should be measured specifically to ascertain their direct influence. For example, an organization may have a strong climate for the protection of physical safety but at the same time have a very weak climate for the protection of psychological safety. Aligned with the call for a "climate for something" (Schneider and Reichers 1983), PSC refers to a climate specifically for employees' psychological health.

Organizations, or work units, with high PSC, are anticipated to have top management and leaders who give a higher priority to employees' psychological health compared to productivity imperatives. By exhibiting such a concern about protecting workers from psychological risks, management in high PSC organizations commits to implementing certain policies, practices, and procedures in relation to the protection of workers' psychological health, along with better communication and a clear demonstration of upholding the value of protecting psychological health. The policies, practices, and procedures of a high PSC organization are reflected in four main domains, namely, (a) management priority for psychological health, (b) management commitment and support for stress prevention, (c) organizational communication encouraging the voice of employees about psychological health concerns, and (d) organizational member, manager, and employees or their representatives, participation, and involvement in dealing with psychological health issues (Hall et al. 2010).

Management priority about psychological health entails the perception by employees that the management will always prioritize their psychological health as a more important concern than productivity. This indicates that during the completion of their work, employees perceive that they will not be expected to prioritize productivity imperatives that may place their psychological health at risk, such as taking on an excessively cognitively demanding workload without training and support to complete the tasks. Next, management commitment and support reflects the willingness of management to make decisions and undertake prompt action to correct threats to psychological health. An example would be the development of policies and procedures in the workplace to identify, intervene, and prevent bullying. Organizational communication is perceived by how much the organization promotes an exchange between the employees and senior management in terms of how psychological health issues affect them, via communication tools or reporting systems. Lastly, the organizational participation and involvement includes the participation or collaboration process by involving different parties including the employees, worker unions, and occupational health and safety representatives, in relation to issues that impact psychological health.

These four domains were initially summed up following an extensive review on the stress intervention process and safety climate literature by Dollard and Bakker (2010). They incorporate the main ingredients of what an organization should focus on when the development of high PSC is required. These theoretical domains were supported by qualitative interviews among Australian and Malaysian employees across different settings. Although some details of how PSC is being perceived and understood by the employees might be different, semi-structured interviews revealed that the high PSC context is characterized by these four elements. For example, McLinton et al. (2018a) conducted a qualitative study among South Australian frontline healthcare workers and found support for the four PSC domains. The researchers identified that there were six elements denoting a high-risk workplace with potentially low levels of PSC. These six elements included group expectations, exposure level, immediate manager leadership style, top level management involvement, communication, and conflicting pressures. Another study by Potter et al. (2019) again examined the four PSC domains

through semi-structured interviews among the managers in high PSC workgroups from university setting. Within these domains three major themes emerged from the interviews revealing that a high PSC group possesses (a) shared sense of meaningful work and social support, (b) high level of employee job crafting, and (c) middle management support for employee psychological health. The authors argue that these three themes reflect an enactment of all four PSC domains in the work setting. Using a sample from a different continent, Loh et al. (2019) in their study among 18 Malaysian healthcare workers supported the PSC domains of management priority, management support, and organizational communication with common themes within healthcare workplaces involving safety procedures, communication, and management involvement.

Measuring PSC: The PSC-12 Scale

PSC is measured by assessing employees' perception toward the organizations' policies and regulations in relation to employee psychological health. The most commonly used measurement of PSC was developed by Hall et al. (2010) consisting of all four subscales based on PSC theoretical principles. The scale was tested using three different samples of Australian employees (PSC was included in the broader psychosocial risk assessment tool – the Australian Workplace Barometer). Using a pilot study among 78 participants, Hall and colleagues shortened the original 26 items of PSC scale (Dollard and Kang 2007) into 12 items and further validated the scale by conducting the confirmatory factor analysis using the data from 398 Australian workers. The convergent and divergent validity of the scale was confirmed by using both the second and the third sample ($n = 106$ Australian healthcare workers residing from 16 teams). The results showed that both individual and team-level PSC were related to job design (i.e., skill discretion, control, social support, and job demands) and employees' psychological health outcomes (i.e., emotional exhaustion, psychological distress, and depression). So far, the PSC-12 scale has been well-validated and widely used in most studies on PSC. This scale has since been translated into different languages including Chinese, French, Malay, German, Iranian, and Vietnamese.

Since the perceptions of work and individual response styles might be influenced by culture (Erez 2010; Iwata 2014), to further test the appropriateness of the PSC-12, researchers from Germany conducted a qualitative study to understand the appropriateness of using PSC-12 in a German context (Ertel and Formazin 2019). By using a cognitive evaluation approach, Ertel and Formazin (2019) interviewed the participants taking the PSC-12 and analyzed their cognitive appraisal during the process. According to the results, the researchers reworded some of the items to improve the clarity and increase comprehensibility within the German context. In addition to the revision of PSC-12 on German version, Ertel and Formazin (2019) noted some overlapping items from the PSC scale, suggesting a shortened version of the scale. In line with this, and in consideration of the practical utility of a shorter scale, Dollard et al. (2019) have proposed a new short PSC tool by reducing the

Table 1 PSC domains and items in the PSC-12 scale

PSC domain	Items
Management commitment and support	1. In my workplace senior management acts quickly to correct problems/issues that affect employees' psychological health
	2. Senior management acts decisively when a concern of an employees' psychological status is raised
	3. Senior management shows support for stress prevention through involvement and commitment[a]
Management priority	4. Psychological well-being of staff is a priority for this organization
	5. Senior management clearly considers the psychological health of employees to be of great importance
	6. Senior management considers employee psychological health to be as important as productivity[a]
Organizational communication	7. There is good communication here about psychological safety issues which affect me[a]
	8. Information about workplace psychological well-being is always brought to my attention by my manager/supervisor
	9. My contributions to resolving occupational health and safety concerns in the organization are listened to
Organizational participation	10. Participation and consultation in psychological health and safety occur with employees' unions and health and safety representatives in my workplace
	11. Employees are encouraged to become involved in psychological safety and health matters
	12. In my organization, the prevention of stress involves all levels of the organization[a]

[a]Items included in the short PSC-4 scale (with permission, Hall et al. 2010)

PSC-12 to four items. Based on theoretical considerations, Dollard (2019) suggested four items, one from each domain, which could be used as an ultrashort PSC scale, and supported the veracity of the new scale with sound predictive validity and reliability using three time-lagged Australian samples. However, both the revised and the ultrashort PSC scales lack extensive empirical testing suggesting that more studies are required. In addition, while the German version of PSC scales might be useful within the German context, the idea of using cognitive appraisal approach could be considered by other researchers while undertaking PSC-12 in a different context or cultural background. Table 1 shows the PSC-12 domain and its items.

PSC Versus Other Related Constructs

Ever since the proposal of PSC, debate continues about how PSC differs from other safety-related constructs such as the Zohar's safety climate, organizational support, and team psychological safety. Although early research on PSC established the discriminant validity of PSC with the abovementioned constructs (Idris et al. 2012), confusion

remains among the researchers. This can be seen from a constant need to explain and compare how PSC is distinct and even precedes some of the psychological safety-related concepts for nearly a decade (Mansour and Tremblay 2018; Huyghebaert et al. 2018a). Although these constructs, safety climate, organizational support, and team psychological safety are very similar to PSC, even sharing some characteristics, they are theoretically and empirically distinct from each other.

PSC Is Not Safety Climate

Among these, safety climate is a traditional organizational climate that has been long introduced to the academic field. Zohar first introduced safety climate as shared perceptions that employees develop regarding the safety aspects of their working environment (Zohar 1980). Safety climate and PSC are distinct in at least three ways. Firstly, safety climate and PSC have different target outcomes. Different from PSC, safety climate has been always linked to the physical safety aspects and outcomes of the organization. Safety climate entails how employees perceive that their organization rewards, expects, and highlights safety-related behaviors over and above the productivity performance of an organization (Griffin and Curcuruto 2016). However, most of these "safety" features refer to the physical aspects of injuries, accidents, workarounds, etc. Secondly, the mechanism of how safety climate relates to safety outcomes is also very much different from PSC. While PSC is suggested as a lead indicator of job design (will be discussed shortly), safety climate is linked with individual behaviors, attitudes, and knowledge on safety (Griffin and Curcuruto 2016).The common tested link between safety climate and safety outcomes is through individual behavior such as safety engagement, safety compliance, safety knowledge, and safety motivation (Griffin and Curcuruto 2016). Thirdly, unlike PSC, the domain of safety climate is yet to reach a consensus (Alruqi et al. 2018). Many different domains have been studied in the safety climate literature and hence leading to an extent that safety climate researchers have difficulties on integrating these domains into a comprehensive, mutually agreed framework. Comparatively, PSC has a rather consensually theoretical framework with the proposed four main domains as discussed above.

Aside from the differences in theoretical viewpoints, several empirical studies have tested both PSC and physical safety climate simultaneously and concluded that PSC is the stronger predictor for job design and psychological-related health problems, while safety climate focuses more on the physical injuries and accidents, as well as physical safety behaviors. Recently Bronkhorst and Vermeeren (2016) conducted a multilevel cross-sectional study among a large sample of 8761 healthcare workers from 177 healthcare organizations in the Netherlands finding that PSC, but not safety climate, is associated with employees' emotional exhaustion and other health outcomes. In addition, the researchers found no significant effect between safety climate and MSDs. They hence argue that PSC is more related to health outcomes, because safety-related outcomes such as injuries have mostly happened within a short timeframe and can be prevented through physical environment (e.g., good safety climate), but health outcomes might be due to long-term exposure to, for example, a low PSC context. In line

with this argument, PSC seems to be superior to safety climate in ensuring the sustainability of an organization and protecting employees' well-being in the future. In a similar vein, another study by Bronkhorst (2015) compared the difference between safety climate and PSC in terms of the moderation of the relationship between psychosocial job conditions and safety behaviors. Again, PSC showed a stronger moderation impact in influencing the effect of job conditions on safety behaviors compared to safety climate.

PSC Is Not Perceived Organizational Support

PSC is also related to another concept called perceived organizational support (POS). Proposed by Eisenberger and colleagues in 1986, POS is defined as employees' "global beliefs concerning the extent to which the organisation values their contributions and cares about their well-being" (Eisenberger et al. 1986). PSC focuses on psychological health as a value in and of itself, alongside well-being. An additional difference between POS and PSC lies in the emphasis in PSC about the prioritization of employees' psychological health over productivity. Although PSC also contains the element of support from the organizational level, it captures a more comprehensive picture of "what" is being designed and provided by the organization in the effort to protect the workers' psychological health and well-being. The distinctiveness between POS and PSC is also presented in their assumptions. Underlying the theory of POS is the social exchange principle that emphasizes the expectations of mutual commitment between the employers and employees. Employees who receive adequate POS likely feel obligated to "return" the good deed of the organization by performing well in achieving organizational objectives or goals. Apart from the social exchange principle, PSC, as well as POS, is also more likely working as a resource that motivates the employees to strive within their workplace. In contrast to safety climate, the concept of POS is not often tested together with PSC. One example is Nguyen et al. (2017) who found that PSC is related to POS. Theoretically they argued, and were supported by their results, that PSC is a lead indicator of POS. Notably this study was conducted within a cross-sectional design, so the causal relationship between PSC and POS remain unconfirmed. Also PSC was more strongly related to engagement and well-being than POS. Another study is Idris et al. (2012) that have shown the empirical evidence on the differences between POS and PSC using a confirmatory factor analysis. Moreover, by using hierarchical linear modelling (HLM), organizational PSC was a better predictor of individual reports of psychological distress and emotional exhaustion than POS.

PSC Is Not Team Psychological Safety

Another similar concept that is related to PSC is the construct, team psychological safety. This concept originally proposed by Edmondson (1999) shares similar properties with PSC in relation to its focus on the psychological well-being of the employees. Team psychological safety is defined as a shared perception of the employees toward psychological security in their workplaces. The central tenet of

team psychological safety is that an employee who is experiencing a high psychological safety in the work team will be able to perform effectively because they are free from the threat of psychological harm and are therefore able to engage in better learning processes (Edmondson 1999). There is a wide range of research linking team psychological safety with the performance of employees, innovation, and creativity (Edmondson and Lei 2014). The concepts of team psychological safety and PSC differ in significant ways. PSC is an upper-level phenomenon that focuses on employee-shared perceptions of the organizational or team context, an upstream multilevel influence. PSC is built upon the idea of organizational climate that highlights policies, practices, and procedures about the protection of psychological health within organizations. Team psychological safety, however, reflects a comfortable working environment characterized with interpersonal respect and trust that allows freedom to speak up and encourage positive behaviors (Walumbwa and Schaubroeck 2009). Nonetheless, some of the team psychological safety literature have used the term "psychological safety climate" to refer to the construct measuring at team level (Deng et al. 2019; Koopmann et al. 2016), creating more confusion with PSC. Note that in the PSC vernacular, psychological PSC refers to PSC that is observed by individual workers, whereas organizational or team PSC refers to PSC that is observed by a collective usually by aggregating individual scores to the organizational or team level. In fact, one of the articles with the title of "psychological safety climate" was actually operationalizing PSC in their study (Nguyen et al. 2017). However, little research has been conducted in comparing both psychological safety and PSC, with only one exceptional study that investigated the distinctiveness of PSC with all three constructs (Idris et al. 2012). Again organizational PSC was a better predictor of psychological distress and emotional exhaustion than team psychological safety (and POS).

The Propositions of PSC and Its Evidence

Since the first publication of PSC in 2010, the theory of PSC has been extended and revised. Several theoretical assumptions or propositions of PSC have been modified and integrated into the framework. In addition to the first book of PSC, published in 2019, PSC theory is now an established work stress theory that incorporates organizational climate within a multilevel work stress theoretical framework offering practical implications for the management of work stress within occupational health interventions. Table 2 summarizes the propositions of PSC theory, and Fig. 2 depicts the theoretical framework of PSC implied by the most recent PSC publications.

Proposition 1: PSC Is the Lead Indicator of Job Conditions and Social Relational Aspects at Work

The first proposition of PSC theory is that PSC is the cause of the causes for work stress, particularly through job design (Dollard and Bakker 2010) and socio-relational aspects of work (Law et al. 2011). Job design can be further categorized into

Table 2 Propositions of psychosocial safety climate

Proposition 1	PSC is the lead indicator of job conditions and social relational aspects at work
Proposition 2	PSC is an upper-level resource moderating the effects of job demands and/or negative social-relational aspects at work
Proposition 3	PSC is a safety signal encouraging the use of resources
Proposition 4	PSC is a pro-social ecology complementing job resources
Proposition 5	PSC influences individuals' well-being through needs fulfilling
Proposition 6	PSC is salient when there is a congruence between espoused and enacted PSC
Proposition 7	The influence of PSC is affected by its climate strength

two general but appositional aspects, i.e., job demands and job resources (Bakker and Demerouti 2016). On one hand, job demands refer to the job aspects that require continuous effort from the employees in dealing with them with certain costs to their physiological, psychological, and mental condition. On the other hand, job resources are those aspects of work that will help (1) deal with the demands of the job, (2) boost personal growth, and (3) accomplish organizational and job-related goals and tasks (Bakker and Demerouti 2016). Socio-relational aspects at work include the interaction between persons, such as social support and the experience of bullying. The central tenet of PSC theory indicates that if an organization is concerned about the psychological health of the workers, then certain actions are expected to be included during their decision-making process in assigning job scopes, tasks of the workers, and the expectations of the organizations, such as providing appropriate resources and reducing demands.

By extending the popular job design model, the job demands-resources (JDR) model (Bakker and Demerouti 2016), Dollard and Bakker (2010) argued that PSC influences employees' psychological health and well-being through two pathways, namely, the health erosion and the motivational pathways. The health erosion pathway suggests that negative job conditions will lead to negative consequences such as burnout, while the motivational pathway highlights the influence of positive job conditions on work engagement. PSC is proposed as the lead indicator of job conditions which increase job resources and reduce job demands. Several papers on PSC have examined this notion using multilevel modelling. An earlier study of PSC by Law et al. (2011) supported the notion of PSC as the predictor of job resources and job demands. Law and colleagues using a sample of 220 Australian employees from 33 organizations conducted a multilevel modelling analysis revealing the cross-level effect of PSC on employees' emotional exhaustion through a reduction on workplace bullying and harassment (social relational aspects). Later, Dollard et al. (2012a) further confirm the cross-level link between PSC, job characteristics, and psychological health by a two-wave longitudinal study design among remote area nurses ($n = 202$, Time 1; $n = 163$, Time 2) from 48 work teams. They found that PSC could predict psychological strain of the nurses after 2 years through its influence on workload, job control, emotional demands, and supervisor support. In a similar vein, Owen et al. (2016) with a sample of 850 employees from 119 Australian organizations found that organizational PSC showed a positive impact

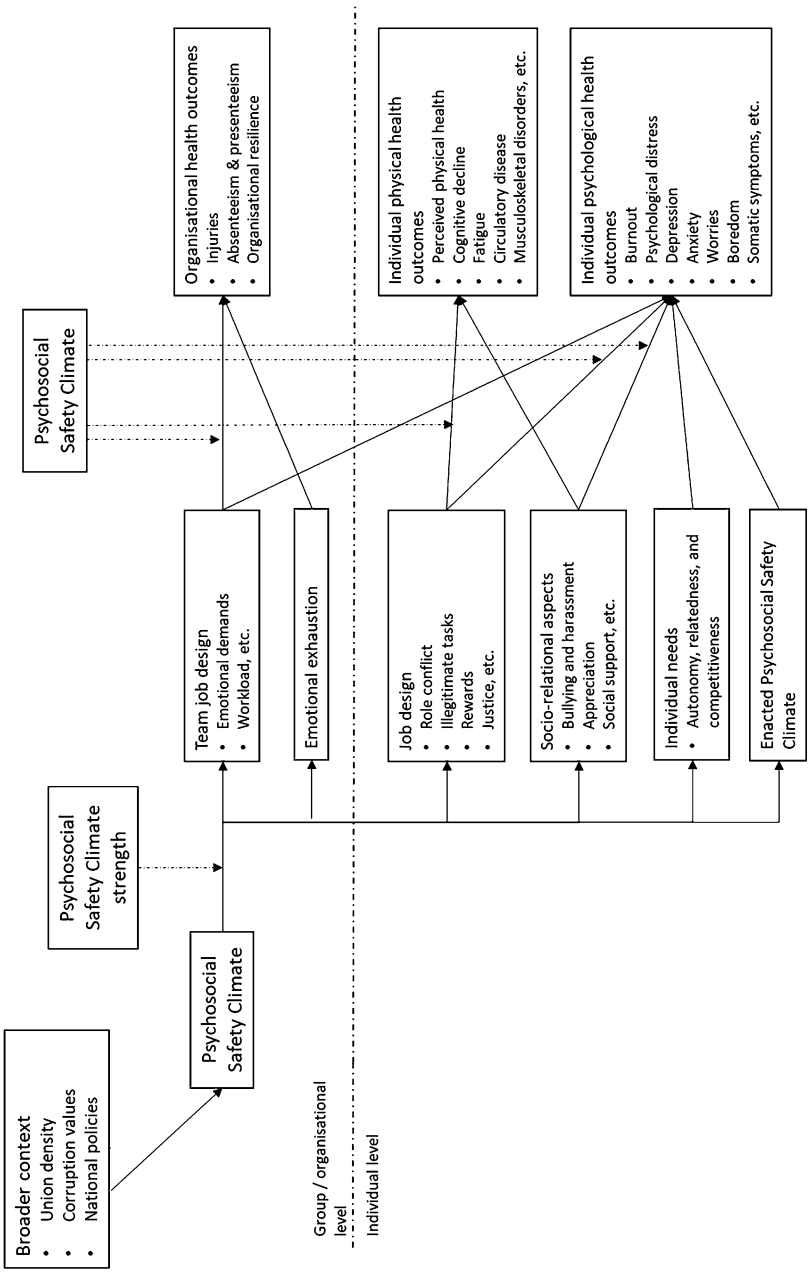

Fig. 2 PSC theoretical framework

on organizational rewards and negative impacts on organizational demands, consequently improving workers' satisfaction and physical and psychological health, respectively.

From a different cultural perspective, Idris et al. (2014) conducted a study among Malaysian employees and examined the mediational pathways between PSC, job characteristics, and change in employees' psychological health (i.e., emotional exhaustion, anxiety, and depression) after 4 months. They revealed the indirect effect of PSC toward employees' emotional exhaustion, but not depression, through emotional demands among 117 employees in 27 private organizations in Malaysia. By using boredom as the outcomes, Krasniqi et al. (2019) in their study among Malaysian employees tested the impact of PSC and job characteristics (i.e., emotional demands and supervisor support) at both individual and organizational level. The results showed that PSC was related to employee boredom via both individual and organizational emotional demands. Notably, only individual-level supervisor support, but not organizational-level supervisor support, mediated the relationship between PSC and job boredom. This indicates that supervisor support only explained the within-group variance of job boredom. Nonetheless, these studies have provided evidence about process and mechanism that PSC as a lead indicator related to psychological health (i.e., through job characteristics).

Some other research on PSC extended this by examining the impact of PSC on physical injuries. For example, Yulita et al. (2014) sought to understand how PSC is linked to two distinctive types of job demands (i.e., challenging and hindrance demands). Theoretically, PSC as a lead indicator of favorable job design should be able to increase challenging demands and reduce hindrance demands. In their empirical results, the researchers found that PSC as an upper-level phenomenon led to a reduction in hindrance demands, but did not increase challenging demands, among 909 Malaysian policemen, which in turn influenced the development of physical health issues. This study has also extended the link of PSC to its effect on the physical aspects of occupational health. Some other evidence on the role of PSC on the development of physical injuries is seen from Zadow et al. (2017). In their three-wave longitudinal study ($n = 214$, 18 teams), they found that PSC was related to registered sickness absence via job conditions and emotional exhaustion. In a similar vein, McLinton et al. (2018a) found some empirical support on the role of PSC in the development of work injuries through violence exposure and musculoskeletal disorders (MSDs) among 288 healthcare workers from 26 teams.

Proposition 2: PSC Is an Upper-Level Resource that Moderates the Effects of Job Demands and/or Negative Social-Relational Aspects at Work

Different from the predictive function of PSC, far less attention has been given to the secondary function of PSC and its moderating effects. In the JDR model, job resources possess the functions of reducing the harmful effect of job demands. Likewise, in PSC theory, PSC may be referred as a job resource located at an

upstream level, since it may buffer demanding working conditions. The reason is PSC reflecting the organizational view on what are the desirable behaviors, attitudes, and outcomes. High PSC organizations are expected to be an environment characterized with high resources in assisting the employees to complete their daily job tasks and achieve the organizational goals. Some studies on PSC as a moderator have yielded interesting and significant results. Of the moderating effects of PSC, scholars so far have investigated three types of moderating functions: (1) PSC as the moderator of the relationship between job demands/socio-relational aspects and psychological health outcomes; (2) PSC as the moderator of the buffering effect of job resources on the relationship between job demands/socio-relational aspects and psychological health outcomes; and (3) PSC as a resource passageway that begets job resources and creates a resource caravan (Hobfoll et al. 2018). In other words, PSC works as a moderator boosting effect of job resources on protecting and improving employees' health outcomes.

The first moderating function of PSC is where PSC acts as a job resource itself. Explained by the conservation of resources (COR) theory, individuals feel stress when there is a loss of resources – a demanding working environment would be a likely cause. This situation could be avoided by having adequate resources to compensate the loss situation. PSC could help to reduce the impact of demands by acting as an upper-level resource that allows the employees to cope with the situations. Employees work under a high PSC environment experiencing a psychological security due to the emphasis of psychological health of the organization. The sense of security hence helps the employees to tackle with the challenges and hindrances at work. Bronkhorst (2015) conducted research among healthcare workers in the Netherlands ($n = 6230$ from 52 organizations) revealing that PSC moderated the relationship between job insecurity and safety behaviors. She argued that when there is high PSC, employees tend to behave safely even under the pressure of high job insecurity. In addition, the study also found that PSC could improve the functions of job resources by encouraging safety behaviors.

Proposition 3: PSC as a Safety Signal Encouraging the Use of Job Resources

While job resources have been well established as an effective moderator of job demands (Bakker and Demerouti 2016), scholars are interested to know what might enhance or hinder the function of job resources. This idea was tested by proposing PSC as the "moderator of the moderators" of the relationship between job demands and its outcomes (Loh et al. 2018) – a three-way interaction between PSC, job resources, and job demands. Two mechanisms could be used to explain how PSC serves as an important boundary condition for job resources, namely, the safety signal theory or the resource passageway. Firstly, PSC as a safety signal (Loh et al. 2018) provides cues about the psychological safety in a workplace to approach, utilize, and request more resources. As a working environment that exhibits concern about psychological health, resources are often available and may be easily assessed

in a high PSC context. If a supervisor cares about their subordinates, they would be willing to help or provide constructive feedbacks to the employees. As such, the employees would be able to obtain the necessary resources to deal with their job demands. Conducting research among Australian policemen from 23 police stations, Dollard et al. (2012b) suggested that a contingent environment is the key for the robust effect of job resources in reducing the detrimental effect of job demands. Using a two-wave longitudinal multilevel design, they revealed that emotional resources are able to moderate the relationship between emotional demands and emotional exhaustion under the conditions of high PSC only. Even if resource levels were high, they could not be used functionally to reduce emotional demands if PSC was low. The result was again tested with a split sample and confirmed the notion of PSC as a safety signal.

Proposition 4: PSC as the Pro-Social Ecology Complementing Job Resources

Apart to be a safety signal, PSC is aligned with theory of COR on resource passageway because it could help to develop more resources in workplaces. In the central tenet of COR, resources tend to tie to each other to create a resource caravan (Hobfoll et al. 2018). Resource caravan passageway is a concept where the social ecology of an organization is useful for resources accumulation, utilization, and bolstering the effect of resources. Under this assumption, Loh et al. (2018) found that PSC acts as a resource caravan passageway which may bolster, compensate, and complement the effect of other resources in the workplaces. In a sample of 429 Malaysian healthcare workers from 53 workgroups, Loh and colleagues conducted hierarchical linear modelling using two-wave longitudinal data. The three-way interaction between team-level PSC x rewards x emotional demands was found to predict employees' somatic complaints, but not emotional exhaustion. Results showed that somatic complaints were at worst when there were both low PSC and low rewards and least reported when both PSC and rewards were high. This reflected the role of PSC in compensating the effect of rewards. PSC did not act as a safety signal in this instance. Rather PSC provides a condition that facilitates the formation of other resources by encouraging more resources to connect and link with each other. The positive ecological condition of PSC allows resources, such as rewards, to achieve their optimal function. For example, when rewards are provided to the employees, under a high PSC environment, it would, more likely, bind with other resources such as fair rewards and positive respect from co-workers and supervisors rather than contempt. So high PSC creates a resource caravan. Hence, in this case, authors found rewards show greatest effect toward individuals' health outcomes, while PSC was reported as high within the team. Notably, the authors only found the interactive relationship between rewards and emotional demands happen at the same time point (cross-sectionally rather than time-lagged). They have provided arguments as to why this might happen. They also found that PSC was the best moderator of emotional demands, compared to decision authority and rewards.

Proposition 5: PSC Influences Individuals' Well-Being Through Needs Fulfilling

Apart from the working condition pathways as explained above, researchers have started to explore how PSC as a work context could affect individual's psychological condition by exploring the relationship of PSC to individual needs. Based on self-determination theory (SDT), Huyghebaert and colleagues conducted several studies in relation to PSC and how it might link to needs thwarting or needs fulfilling among employees, in turn affecting their psychological health (Huyghebaert et al. 2018a, b). SDT posits that individuals possess innate psychological needs, including the need for autonomy, relatedness, and competences. Failing to fulfil these needs will lead to a negative consequence in one's motivation and psychological well-being. In their study among French healthcare nurses, they found that PSC is a factor leading to need fulfilment and reducing need thwarting. Using the idea of SDT, PSC provides an environment that helps to protect individuals via fulfilling their needs. Although these studies that attempts to uncover the psychological mechanism of how PSC leads to positive well-being relied on individual-level data, but suggests a possible mechanism regarding how and why PSC relates to worker psychological health (i.e., through need fulfilment/reduced need thwarting). These individual needs can be viewed as personal valuable resources, which are explained by COR theory. According to the principles of COR theory, individuals strive to protect and invest resources, and hence by fulfilling individual needs, this allows resources gain and reduces need thwarting and protects individuals from the circumstances of resource loss and to be more resilient.

Proposition 6: PSC Is Salient When There Is a Congruence Between Espoused and Enacted PSC

The issue of enacted (i.e., what had been done) and espoused (i.e., what have been said) theory was raised by researchers who underscored the need of alignment between the two (Zohar 2010). Aligning with the concept of value enactment, scholars suggest that by aligning the talk and the action, one could experience positive outcomes. Taking the exemplar of PSC, espoused PSC reflects the policies and procedures that have been introduced and implemented in the organization largely by senior management and enacted PSC means the organizational policies and procedures that have been put into practice by middle managers and supervisors. In their diary study among 109 Malaysians across five consecutive workdays, Yulita et al. (2017) studied the link between team-perceived PSC (i.e., espoused PSC), enacted PSC, and workers' psychological health (i.e., emotional exhaustion). They operationalized daily supervisor support as the enactment of PSC and argued that when working under a high espoused PSC context and high supervisory support on a daily basis, the perception of concern toward employee psychological health is amplified. In their study, the interaction between espoused and enacted PSC had a negative impact on emotional exhaustion. Levels of emotional exhaustion were

lowest when there was high PSC and high supervisor support, in other words, congruence between the espoused and enacted climate. This indicates that when tangible action is taken to practice espoused policies and procedures for workers psychological protection, the influence of PSC may be optimized.

Proposition 7: The Influence of PSC Is Affected by Its Climate Strength

Another interesting construct in the organizational climate research is climate strength. Climate strength reflects within-group variability in climate perceptions. It is conceptualized as the degree of agreement among the employees on the climate of an organization. The operationalization of this construct could be measured by the standard deviation of employee perception or by using some indexes such as the r_{WG}. In their initial study attempt on PSC climate strength, Afsharian et al. (2018) argued that the level of climate strength is important to predict or understand the employees' behaviors in the organization. High climate strength reflects a high homogenous perception among the employees on the working environment. Stronger climate strength would enable one to improve the understanding of the context and hence gain a better understanding or encouragement in engaging on the expected behaviors, in turn leading to positive outcomes. Aligned with the proposition of PSC as the safety signal, high PSC climate strength is expected to strengthen the influence of PSC toward individuals. By using the standard deviation (SD) of PSC, Afsharian and colleague examined whether that climate strength would moderate the influence of PSC on working conditions, emotional exhaustion, and work engagement. However, as opposed to their expectations, they found that PSC climate strength only moderated the relationship between PSC and working conditions on work outcomes (i.e., work engagement) but not emotional exhaustion. They suggested that PSC level itself might be salient for the prediction on working conditions and psychological health. Nonetheless, there are limitations of using SD as the indicator for dispersion model; hence, more empirical studies are needed to test this proposition.

Research on PSC Across Different Cultures

Throughout the development of PSC theory, studies have been conducted across different nations and cultures. While the earlier studies of PSC have mostly originated from Australia and Malaysia, some studies emerged from other countries. The majority of these studies have focused on PSC within a healthcare setting. For example, Bronkhorst and Vermeeren (2016) studied PSC among 8761 healthcare workers from 177 organizations in the Netherlands. Through a test of multilevel structural equation modelling, the authors found that PSC predicts the organizational absenteeism and presenteeism (i.e., going to work despite feeling unwell) via collective emotional exhaustion and MSDs within the organization. Notably Bronkhorst and Vermeeren (2016) also tested physical safety climate in their study

yet were unable to find any statistically significant relationship between physical safety climate and MSDs. They therefore suggested that physical safety climate might be more relevant to safety outcomes compared to health outcomes (i.e., MSDs). In another cross-national study, McLinton et al. (2018b) have reported the mean scores of PSC in the Australian and Malaysian healthcare settings. In comparison, both Australian and Malaysian healthcare workers have reported a lower PSC level than those from other industries suggesting the importance of paying attention to the psychological well-being of healthcare workers. In another continent, Afsharian et al. (2018) investigated PSC levels in hospitals in Iran. From their study, they suggested that the level of PSC is lower in Iranian hospitals compared to those in Australia. Yet their study confirmed that the theory of PSC could be applied to the Middle East context supporting the cross-cultural implication of PSC. Again, in a different cultural background, Pien et al. (2019) revealed that there is a relationship between PSC and perceived health of 1690 Taiwanese nurses from 73 hospitals. Again, they have found the overall mean score of PSC in the healthcare setting in Taiwan (PSC = 34.1) was lower than the established benchmark of PSC (PSC = 41). They noted that the differences between the score of PSC might due to the societal values and the different cultural backgrounds which will be discussed in the following section.

PSC from a Broader Context

Risk management within an organization is influenced by the macro factors such as the labor market policies, societal values, and norms. The current public values on the societal issues are expected to affect the leadership of an organization as well as the implementation on the organizational policies. The formation of organization cultures and norms is largely influenced by the external societal system (i.e., social, cultural, and economic factors are all related to this system) due to the constant interaction and connection with the policies of the government or other national agencies. For example, union density was found to be a national-level predictor of workers' health (Dollard and Neser 2013). Workers' unions are expected to represent the workers and protect workers' welfare and likely influence pro-social workplace policies; hence union density was related to PSC levels across 31 European countries (Dollard and Neser 2013).

Another study extended the investigation of the link between national factors and PSC in organizations by focusing on a social issue, corruption. By using secondary data, Dollard and Jain (2019) retrieved information about corrupt values in society, PSC, and workers' health of 31 European countries. From a multilevel analysis, they have found a negative link between corrupt values and the level of PSC at a national level, in turn leading to workers health and well-being. Studies also found a link between government policy and PSC level across Australian states and territories. Potter et al. (2019) conducted a comprehensive review on the current psychosocial risks-related policy documents in eight jurisdictions in Australia. They noted that Victoria has the most established and detailed policies on handling psychosocial

risks factors at work. Linking this to their earlier work in 2017, Potter et al. (2017) have investigated the data of Australian workers on their PSC level. Victoria has reported the second highest in their overall PSC level. The phenomenon provided new insights on the relationship between national policies and PSC.

Practical Implications of PSC

PSC Benchmarks

It is often a challenge to translate theory into practice. For the purpose of on-site practice, PSC researchers conducted several tests and suggested PSC risk benchmarks for the workplace to avoid job strain (future high demands, low control) and depression. Bailey et al. (2015b) determined that an organization with the total score of PSC $\geq$ 41 could be categorized as a low-risk group for job strain and depressive symptoms, while PSC $<$ 37 is considered as high-risk, and some interventions might be required. From their study, the researchers also suggested that by increasing the PSC level beyond 37, the population attribution risks (PAR) of job strain and depressive symptoms could be reduce as much as 14% and 16%, respectively. A few years later, Dormann et al. (2017) added on a critical value to the benchmarks of PSC. By using a continuous time structural equation modelling, Dormann and colleagues reported that PSC $\leq$ 26 would predict a doubled risk on clinical depression. Taken both studies into account, several benchmarks may be used to identify the status of an organization as very high risk, high risk, medium risk, or low risk of job strain (see Table 3).

Stress Intervention

Work stress intervention has been a challenge to the occupational health experts and practitioners. The target of the interventions has usually focused on either the

Table 3 PSC range score, risk level of organization, and prognosis

Risk level	PSC range	Prognosis
Low risk	PSC $\geq$41	*Performing well, improvements in PSC levels might be noted; increased leader performance in PSC*
Medium risk	41 $<$ PSC $>$37	*Steady state, need more enacting of PSC principles*
High risk	37 $\leq$ PSC $>$26	*Increasing PSC levels from low could reduce depression by 16% and job strain by 14%*
Very high risk	PSC $\leq$26	*Urgent action required to prevent further dramatic increases in depressive periods, worsening conditions (*e.g., *increased bullying)*

Note: © Bailey and Dollard (2019)

individual or organizational structures. Individual-focused interventions target on improving the personal coping strategies of the employees and helping them adapt to the working environment. Yet, recent researchers challenge this approach and have moved toward the organizational intervention (Nielsen and Miraglia 2017). Different to the individual intervention, organizational stress interventions aim to address occupational issues at the primary level by tackling the root cause of the work stress, which generally refers to the working condition. Given that PSC is the lead indicator of working condition, it is expected that by incorporating PSC framework will help for an effective intervention (Dollard 2012).

Several attempts have been made to improve PSC in workplaces (Haar 2018; Rasdi et al. 2018). Dollard and Karasek (2010), for example, described how PSC could be nurtured from the actions, process, and progress of a participatory action approach. In line with these initial findings, Rickard et al. (2012) reported that PSC was increased after an intervention of improving communication, reducing workload, and increasing resources was implemented. However, this result was limited to one out of two participatory hospitals in the study. Adding to this is the unexpected results reported by Dollard and Zadow (2018). In their study, Dollard and Zadow (2018) described and reported the preparatory phase of an intervention. The preparatory phase included the educational workshops in identifying stress and coping strategies. These educational workshops did not improve the organizational PSC at the post-test assessment which was not surprising given no changes were yet made to policies, practices, or procedures. Another intervention study among nurses at Australian remote area showed similar findings (Lenthall et al. 2018). These contradictory results would guarantee a further exploration on what could help to improve PSC in the future.

Researchers have also suggested the best practice of how an organizational management could design and implement an intervention in managing the psychosocial risks at work. Bailey and colleagues published the PSC hierarchy of control (PSC-HOC) that provides a guideline on how to integrate PSC theory into real practice (Bailey and Dollard 2014). The PSC-HOC has been suggested as a practical tool to help practitioners develop interventions that would be helpful in tackling psychosocial risks factors at work. Starting from the values of senior management to job design to individual factors, PSC-HOC consists of several stages that required the attention from top management to manage stress issues at workplace. Strategies can be developed according to each level, and PSC could be a useful measure in assessing the effectiveness of the intervention.

Summary and Where We Should Move from Here

In summary, research on PSC to date has revealed the theoretical pathways of how PSC influences employees' health through job design and other mediators. The latest research on PSC has also uncovered new mechanisms involved in the link between PSC and employee health. Different research methodologies have been applied (e.g., cross-sectional and longitudinal design, diary studies, analytical review,

multinational study, and mixed methods) to justify the notion of PSC as a lead indicator and boundary condition of a favorable working condition and psychologically safe environment. Several reviews on PSC studies have further provided an extensive summary on the PSC research (Yulita et al. 2016; Zadow et al. 2019). The first book of PSC has also been published, establishing additional evidence on the roles and importance of PSC in different work settings and nations, expanding the theory beyond the JD-R framework (Dollard 2019). Despite that, some unanswered questions still remain, in relation to the antecedents of PSC and the time it takes for the emergence of PSC and so on. In their final chapter of the PSC book, Dormann et al. (2019) raised six issues that require further research attention:

First, they called for more "shortitudinal research" by incorporating shorter time interval between the multi-waves of data collection.
Second, aligning with the hierarchical influence within an organization, they suggest researchers to examine PSC at different levels.
Third, expanding the variables used in PSC research beyond the JD-R model.
Fourth, studying PSC across different cultures, context, and nations.
Fifth, integrating PSC with other objective measurements, such as blood flow and registered data such as the medication history.
Sixth, investigating the complementing organizational characteristics such as the ethical climate.

Cross-References

- ▶ Effort-Reward Imbalance and Occupational Health
- ▶ Organizational-Level Interventions and Occupational Health
- ▶ The Demand Control Support Work Stress Model

References

Afsharian A, Zadow A, Dollard MF, Dormann C, Ziaian T (2018) Should psychosocial safety climate theory be extended to include climate strength?. J Occup Health Psych 23(4):496. https://doi.org/10.1037/ocp0000101

Alruqi WM, Hallowell MR, Techera U (2018) Safety climate dimensions and their relationship to construction safety performance: a meta-analytic review. Saf Sci 109:165–173. https://doi.org/10.1016/j.ssci.2018.05.019

Bailey TS, Dollard MF (2014) Psychosocial hazard management and the psychosocial safety climate hierarchy of control (PSC-HOC). In: Dollard MF, Bailey TS (eds) Australian workplace barometer: psychosocial safety climate and working conditions in Australia. Academic, Samford Valley, pp 289–284

Bailey TS, Dollard MF (2019) Mental health at work and the corporate climate: implications for worker health and productivity. University of South Australia, Adelaide, Australia

Bailey TS, Dollard MF, McLinton SS, Richards PAM (2015a) Psychosocial safety climate, psychosocial and physical factors in the aetiology of musculoskeletal disorder symptoms and workplace injury compensation claims. Work Stress 29(2):190–211. https://doi.org/10.1080/02678373.2015.1031855

Bailey TS, Dollard MF, Richards PA (2015b) A national standard for psychosocial safety climate (PSC): PSC 41 as the benchmark for low risk of job strain and depressive symptoms. J Occup Health Psychol 20(1):15–26. https://doi.org/10.1037/a0038166

Bakker AB, Demerouti E (2016) Job demands-resources theory: taking stock and looking forward. J Occup Health Psychol. https://doi.org/10.1037/ocp0000056

Bronkhorst B (2015) Behaving safely under pressure: the effects of job demands, resources, and safety climate on employee physical and psychosocial safety behavior. J Saf Res 55:63–72. https://doi.org/10.1016/j.jsr.2015.09.002

Bronkhorst B, Vermeeren B (2016) Safety climate, worker health and organizational health performance. Int J Workplace Health Manag 9(3):270–289. https://doi.org/10.1108/ijwhm-12-2015-0081

Cox S, Flin R (1998) Safety culture: Philosopher's stone or man of straw? Work Stress 12(3):189–201. https://doi.org/10.1080/02678379808256861

Deng H, Leung K, Lam CK, Huang X (2019) Slacking off in comfort: a dual-pathway model for psychological safety climate. J Manag 45(3):1114–1144

Dollard MF (2012) Psychosocial safety climate: a lead indicator of workplace psychological health and engagement and a precursor to intervention success. In: Biron C, Karanika-Murray M, Cooper CL (eds) Improving organizational interventions for stress and well-being: addressing process and context. New York: Routledge

Dollard MF (2019) The PSC-4: a short PSC tool. In: Dollard MF, Dormann C, Idris MA (eds) Psychosocial safety climate as a new work stress theory. Springer, Cham, pp 385–410

Dollard MF, Bakker AB (2010) Psychosocial safety climate as a precursor to conducive work environments, psychological health problems, and employee engagement. J Occup Organ Psychol 83:579–599. https://doi.org/10.1348/096317909X470690

Dollard MF, Kang S (2007) Psychosocial safety climate measure. Work & Stress Research Group, University of South Australia, Adelaide

Dollard MF, Karasek R (2010) Building psychosocial safety climate: evaluation of a socially coordinated PAR risk management stress prevention study. In: Houdmant J, Leka S (eds) Contemporary occupational health psychology: global perspectives on research and practice. Wiley-Blackwell, Oxford, pp 208–234

Dollard MF, Jain A (2019) A corruption of public values at work; psychosocial safety climate, work conditions, and worker health across 31 European Countries. In Psychosocial Safety Climate. Springer, Cham, pp 77–106

Dollard MF, Neser DY (2013) Worker health is good for the economy: union density and psychosocial safety climate as determinants of country differences in worker health and productivity in 31 European countries. Soc Sci Med 92:114–123. https://doi.org/10.1016/j.socscimed.2013.04.028

Dollard MF, Zadow A (2018) Evaluation of the preparatory phase of a stress intervention: a case study from the Australian public sector. In: Nielsen K, Noblet A (eds) Organizational interventions for health and Well-being: a handbook for evidence-based practice. Routledge, New York, pp 113–143

Dollard MF, Opie T, Lenthall S, Wakerman J, Knight S, Dunn S, Rickard G, MacLeod M (2012a) Psychosocial safety climate as an antecedent of work characteristics and psychological strain: a multilevel model. Work Stress 26(4):385–404. https://doi.org/10.1080/02678373.2012.734154

Dollard MF, Tuckey MR, Dormann C (2012b) Psychosocial safety climate moderates the job demand-resource interaction in predicting workgroup distress. Accid Anal Prev 45:694–704. https://doi.org/10.1016/j.aap.2011.09.042

Dollard MF, Dormann C, Tuckey MR, Escartín J (2017) Psychosocial safety climate (PSC) and enacted PSC for workplace bullying and psychological health problem reduction. Eur J Work Organ Psy 26(6):844–857. https://doi.org/10.1080/1359432x.2017.1380626

Dollard MF, Dormann C, Idris MA (2019) Psychosocial safety climate: a new work stress theory. Springer International Publishing, Cham

Dormann C, Owen M, Dollard M, Guthier C (2017) Translating cross-lagged effects into incidence rates and risk ratios: the case of psychosocial safety climate and depression. Work Stress 32(3):248–261. https://doi.org/10.1080/02678373.2017.1395926

Dormann C, Dollard MF, Idris MA (2019) PSC: current status and implications for future research. In: Dollard MF, Dormann C, Idris MA (eds) Psychosocial safety climate: a new work stress theory. Springer, Cham, pp 431–449

Edmondson A (1999) Psychological safety and learning behavior in work teams. Adm Sci Q 44(2):350–383

Edmondson AC, Lei Z (2014) Psychological safety: the history, renaissance, and future of an interpersonal construct. Annu Rev Organ Psych Organ Behav 1(1):23–43. https://doi.org/10.1146/annurev-orgpsych-031413-091305

Eisenberger R, Huntington R, Hutchison S, Sowa D (1986) Perceived organizational support. J Appl Psychol 71(3):500–507

Erez M (2010) Culture and job design. J Organ Behav 31(2–3):389–400. https://doi.org/10.1002/job.651

Ertel M, Formazin M (2019) An approach to the further development and application of the PSC tool by applying cognitive interviewing in Germany. In: Dollard MF, Dormann C, Idris MA (eds) Psychosocial safety climate: a new work stress theory. Springer, Cham, pp 325–340

Griffin MA, Curcuruto M (2016) Safety climate in organizations. Annu Rev Organ Psych Organ Behav 3:191–212

Haar J (2018) Overview of the perpetual guardian 4-day (paid 5) work trial [Industry report]. Auckland University of Technology

Hackman JR, Oldham GR (1976) Motivation through the design of work: test of a theory. Organ Behav Hum Perform 16(2):250–279. https://doi.org/10.1016/0030-5073(76)90016-7

Hall GB, Dollard MF, Coward J (2010) Psychosocial safety climate: development of the PSC-12. Int J Stress Manag 17(4):353–383. https://doi.org/10.1037/a0021320

Hobfoll SE, Halbesleben J, Neveu J-P, Westman M (2018) Conservation of resources in the organizational context: the reality of resources and their consequences. Annu Rev Organ Psych Organ Behav 5(1):103–128. https://doi.org/10.1146/annurev-orgpsych-032117-104640

Hofmann D, Burke MJ, Zohar D (2017) 100 years of occupational safety research: from basic protections and work analysis to a multilevel view of workplace safety and risk. J Appl Psychol 102(3):375–388. https://doi.org/10.1037/apl0000114

Huyghebaert T, Gillet N, Fernet C, Lahiani F-J, Fouquereau E (2018a) Leveraging psychosocial safety climate to prevent ill-being: the mediating role of psychological need thwarting. J Vocat Behav 107:111–125. https://doi.org/10.1016/j.jvb.2018.03.010

Huyghebaert T, Gillet N, Lahiani F-J, Dubois-Fleury A, Fouquereau E (2018b) Psychological safety climate as a human resource development target: effects on workers functioning through need satisfaction and thwarting. Adv Dev Hum Resour 20(2):169–181. https://doi.org/10.1177/1523422318756955

Idris MA, Dollard MF, Coward J, Dormann C (2012) Psychosocial safety climate: conceptual distinctiveness and effect on job demands and worker psychological health. Saf Sci 50:19–28. https://doi.org/10.1016/j.ssci.2011.06.005

Idris MA, Dollard MF, Yulita (2014) Psychosocial safety climate, emotional demands, burnout, and depression: a longitudinal multilevel study in the malaysian private sector. J Occup Health Psychol 19(3):291–302. https://doi.org/10.1037/a0036599

International Labour Organization (2019) Work for a brighter future. International Labour Office, Geneva

Iwata N (2014) Cultural distinctiveness in response bias. In: Dollard MF, Shimazu A, Nordin RB, Brough P, Tuckey MR (eds) Psychosocial factors at work in the Asia Pacific. Springer, Dordrecht

Jiang L, Lavaysse LM, Probst TM (2019) Safety climate and safety outcomes: a meta-analytic comparison of universal vs. industry-specific safety climate predictive validity. Work Stress 33(1):41–57. https://doi.org/10.1080/02678373.2018.1457737

Karasek R (1979) Job demands, job decision latitude and mental strain: implications for job redesign. Adm Sci Q 24(2):285–308. https://doi.org/10.2307/2392498

Koopmann J, Lanaj K, Wang M, Zhou L, Shi J (2016) Nonlinear effects of team tenure on team psychological safety climate and climate strength: implications for average team member performance. J Appl Psychol 101(7):940

Korunka C, Kubicek B (2017) Job demands in a changing world of work. In: Korunka C, Kubicek B (eds) Job demands in a changing world of work. Springer, Cham

Krasniqi V, Yulita, Idris MA, Dollard MF (2019) Psychosocial safety climate and job demands–resources: a multilevel study predicting boredom. In: Dollard MF, Dormann C, Idris MA (eds) Psychosocial safety climate: a new work stress theory. Springer, Cham, pp 129–148

Law R, Dollard MF, Tuckey MR, Dormann C (2011) Psychosocial safety climate as a lead indicator of workplace bullying and harassment, job resources, psychological health and employee engagement. Accid Anal Prev 43:1782–1793. https://doi.org/10.1016/j.aap.2011.04.010

Lenthall S, Wakerman J, Dollard MF, Dunn S, Knight S, Opie T, Rickard G, MacLeod M (2018) Reducing occupational stress among registered nurses in very remote Australia: a participatory action research approach. Collegian 25(2):181–191. https://doi.org/10.1016/j.colegn.2017.04.007

Lesener T, Gusy B, Wolter C (2019) The job demands-resources model: a metaanalytic review of longitudinal studies. Work Stress 33(1):76–103. https://doi.org/10.1080/02678373.2018.1529065

Loh MY, Idris MA, Dollard MF, Isahak M (2018) Psychosocial safety climate as a moderator of the moderators: contextualizing JDR models and emotional demands effects. J Occup Organ Psychol 91(3):620–644. https://doi.org/10.1111/joop.12211

Loh MY, Idris MA, Dollard MF (2019) Physical and psychosocial safety climate among Malaysian healthcare workers: a qualitative study. In: Dollard MF, Dormann C, Idris MA (eds) Psychosocial safety climate: a new work stress theory. Springer, Cham, pp 229–250

Mansour S, Tremblay D-G (2018) Psychosocial safety climate as resource passageways to alleviate work-family conflict. Pers Rev 47(2):474–493. https://doi.org/10.1108/pr-10-2016-0281

McLinton SS, Dollard MF, Tuckey MMR (2018a) New perspectives on psychosocial safety climate in healthcare: a mixed methods approach. Saf Sci 109:236–245. https://doi.org/10.1016/j.ssci.2018.06.005

McLinton SS, Loh MY, Dollard MF, Tuckey MMR, Idris MA, Morton S (2018b) Benchmarking working conditions for health and safety in the frontline healthcare industry: perspectives from Australia and Malaysia. J Adv Nurs. https://doi.org/10.1111/jan.13580

Nguyen DTN, Teo STT, Grover SL, Nguyen NP (2017) Psychological safety climate and workplace bullying in Vietnam's public sector. Public Manag Rev 19:1415–1436. https://doi.org/10.1080/14719037.2016.1272712

Nielsen K, Miraglia M (2017) What works for whom in which circumstances? On the need to move beyond the 'what works?' Question in organizational intervention research. Hum Relat 70(1):40–62. https://doi.org/10.1177/0018726716670226

Owen M, Bailey TS, Dollard MF (2016) Psychosocial safety climate as a multilevel extension of ERI theory: evidence from Australia. In: Siegrist J, Wahrendorf M (eds) Work stress and health in a globalized economy, aligning perspectives on health, safety and Well-being. Springer, Cham, pp 189–217

Parker SK, Morgeson FP, Johns G (2017) One hundred years of work design research: looking back and looking forward. J Appl Psychol 102(3):403–420. https://doi.org/10.1037/apl0000106

Pien LC, Cheng Y, Cheng WJ (2019) Psychosocial safety climate, workplace violence and self-rated health: A multi-level study among hospital nurses. J Nurs Manage 27(3):584–591. https://doi.org/10.1111/jonm.12715

Potter RE, Dollard MF, Owen MS, O'Keeffe V, Bailey T, Leka S (2017) Assessing a national work health and safety policy intervention using the psychosocial safety climate framework. Saf Sci 100:91–102. https://doi.org/10.1016/j.ssci.2017.05.011

Potter RE, Bailey TS, Dollard MF (2019) A qualitative investigation into high psychosocial safety climate university work groups. In: Dollard MF, Dormann C, Idris MA (eds) Psychosocial safety climate: a new work stress theory. Springer, Cham, pp 251–270

Rasdi I, Ismail NF, Kong ASS, Saliluddin SM (2018) Introduction to customized occupational safety and health website and its effectiveness in improving psychosocial safety climate (PSC) among police officers. Malays J Med Health Sci 14(2):67–73

Rickard G, Lenthall S, Dollard MF, Opie T, Knight S, Dunn S, Wakerman J, MacLeod M, Seiler J, Brewster-Webb D (2012) Organisational intervention to reduce occupational

stress and turnover in hospital nurses in the Northern Territory, Australia. Collegian 19(4):211–221

Schneider B, Reichers AE (1983) On the etiology of climates. Pers Psychol 36:19–39

Schneider B, Gonzalez-Roma V, Ostroff C, West MA (2017) Organizational climate and culture: reflections on the history of the constructs in the Journal of Applied Psychology. J Appl Psychol 102(3):468–482. https://doi.org/10.1037/apl0000090

Walumbwa FO, Schaubroeck J (2009) Leader personality traits and employee voice behavior: mediating roles of ethical leadership and work group psychological safety. J Appl Psychol 94(5):1275–1286. https://doi.org/10.1037/a0015848

Yulita, Idris MA, Dollard MF (2014) A multi-level study of psychosocial safety climate, challenge and hindrance demands, employee exhaustion, engagement and physical health. In: Dollard MF, Shimazu A, Nordin R, Brough P, Tuckey MR (eds) Psychosocial factors at work in the Asia Pacific. Springer, Dordrecht, pp 127–143

Yulita, Idris MA, Dollard MF (2016) Psychosocial safety climate: past, present, and future research. In: Shimazu A, Nordin RB, Dollard MF, Oakman J (eds) Psychosocial factors at work in the Asia Pacific: from theory to practice. Springer, Cham, pp 89–111

Yulita, Dollard MF, Idris MA (2017) Climate congruence: how espoused psychosocial safety climate and enacted managerial support affect emotional exhaustion and work engagement. Saf Sci 96:132–142. https://doi.org/10.1016/j.ssci.2017.03.023

Zadow A, Dollard MF (2016) Psychosocial safety climate. In: Clarke S, Probst TM, Guldenmund F, Passmore J (eds) The Wiley Blackwell handbook of the psychology of occupational safety and workplace health, 1st edn. Wiley, Chichester

Zadow A, Dollard MF, McLinton SS, Lawrence P, Tuckey MR (2017) Psychosocial safety climate, emotional exhaustion, and work injuries in healthcare workplaces. Stress Health. https://doi.org/10.1002/smi.2740

Zadow A, Dollard MF, Parker L, Storey K (2019) Psychosocial safety climate: a review of the evidence. In: Dollard MF, Dormann C, Idris MA (eds) Psychosocial safety climate: a new work stress theory. Springer, Cham, pp 31–76

Zohar D (1980) Safety climate in industrial organizations: theoretical and applied implications. J Appl Psychol 65:96–102. https://doi.org/10.1037/0021-9010.65.1.96

Zohar D (2010) Thirty years of safety climate research: reflections and future directions. Accident Anal Prev 42(5):1517–1522. https://doi.org/10.1016/j.aap.2009.12.019