The psychosocial work environment, employee mental health, and organizational interventions: Improving research and practice by taking a multilevel approach

Angela Martin, Maria Karanika-Murray, Caroline Biron, & Kirsty Sanderson

This is a non-final version of an article published in final form in:

Martin, A., Karanika-Murray, M., Biron, C., & Sanderson, K. (2014). Invited article: The psychosocial work environment, employee mental health, and organizational interventions: Improving research and practice by taking a multilevel approach. Stress & Health (online first). doi: 10.1002/smi.2593

ABSTRACT

Although there have been several calls for incorporating multiple levels of analysis in employee health and wellbeing research, studies examining the interplay between individual, workgroup, organizational and broader societal factors in relation to employee mental health outcomes remain an exception rather than the norm. At the same time, organizational intervention research and practice also tends to be limited by a single-level focus, omitting potentially important influences at multiple levels of analysis. The aims of this conceptual paper are to help progress our understanding of work-related determinants of employee mental health by: (i) providing a rationale for routine multilevel assessment of the psychosocial work environment; (ii) discussing how a multilevel perspective can improve related organizational interventions and (iii) highlighting key theoretical and methodological considerations relevant to these aims. We present five recommendations for future research, relating to using appropriate multilevel research designs, justifying group level constructs, developing group-level measures, expanding investigations to the organizational level, and developing multilevel approaches to intervention design, implementation and evaluation.

Keywords: psychosocial work environment, mental health, work, multilevel, job stress, organizational interventions, intervention evaluation.

The psychosocial work environment, employee mental health, and organizational interventions: Improving research and practice by taking a multilevel approach

INTRODUCTION

Systematic reviews (Bonde, 2008; Stansfeld & Candy, 2006) and prospective studies (Ferrie et al., 2006b; Melchior et al., 2007) have shown that exposure to psychosocial 'hazards' at work increase the risk of development or exacerbation of mental health problems. A number of disciplinary perspectives have, over the last 40 years, been concerned with understanding these relationships (e.g., Demerouti, Bakker, Nachreiner, & Schaufeli, 2001; Greenberg, 1987; Karasek, 1979; Siegrist, 1996). This has resulted in a substantial volume of knowledge and strong evidence that employees' experiences of their jobs and their workplaces have direct and indirect influences on a variety of indicators of employee mental health (e.g., Bacharach & Bamberger, 2007; Ylipaavalniemi et al., 2005). These indicators include non-specific psychological distress, symptomatology and/or diagnosis of common mental health disorders such as depression and anxiety and non-clinical constructs such as burnout (Martin, Sanderson, & Cocker, 2009). In this paper, we adopt an integrative definition of employee mental health as reflecting any such indicators, all of which have a substantial body of literature attached to them and have significant implications for employee quality of life and organizational effectiveness. Work in this area has primarily focused on data at a single level of analysis concerned with individual differences, largely ignoring potential influences from higher levels of analysis or the interplay between different levels of analysis. The development of occupational health psychology, as an extension of traditional biomedical perspectives, has historically been dominated by an emphasis on the individual (Quick, 1999). Consequently, interventions designed to improve the psychosocial work environment in order to prevent employee mental ill-health also typically consider interventions at a single level.

The use of single level approaches to examining data that are naturally multilevel (or to developing interventions for phenomena which are naturally multilevel) risks missing important influences and limits our understanding of the phenomena under investigation (Bliese & Jex, 2002; Ferrie et al., 2006a; Klein, Conn, Smith, & Sorra, 2001; Klein & Kozlowski, 2000). This omission of broader socio-environmental influences is known as the "psychologistic fallacy" (Bacharach & Bamberger, 2007). Alternatively, the "atomistic fallacy" is associated with drawing inferences at the group level based on individual-level data (Diez-Roux, 1998). Despite numerous calls for integrating multiple levels of contextual factors in occupational health research to address these fallacies (Bliese, Jex, & Halverson, 2002; Cooper, Dewe, & O'Driscoll, 2001; Hurrell, 2005; Johns, 2006; Peterson & Wilson, 2002; Probst, 2010) most studies are still focused on a single, typically individual, level analysis and where they do include multiple levels, they often do so without due consideration of the theoretical and methodological bases of multilevel research design. Building on these prior calls, we explore how this single-level focus has limited research and practice specifically in relation to the study of the relationships between the psychosocial work environment and employee mental health and the implications this has for associated organizational level interventions.

Although by definition organizational interventions should integrate a focus on both the organizational and individual levels, this is not the case in practice. Organizational-level interventions that aim to protect or improve employee mental health focus on context by attempting to change psychosocial working conditions (Hargrove, Quick, Nelson, & Quick, 2011; Semmer, 2011). Because these psychosocial features of work are, to some extent, shared by employees in particular jobs, workgroups, or organizations, a higher-level organizational climate lens offers a useful way to view these conditions. Implementation of organizational interventions that aim to change shared psychosocial work conditions is expected to lead to changes at the individual employee level such as mental health. Multilevel theory suggests that

clear distinctions should be made between levels of analysis, that phenomena should be examined at the level in which they reside, or that the nesting of phenomena into multiple levels should be taken into account. In the case of organizational interventions, these multiple levels involve the level/s at which the intervention is implemented (typically the organization, workgroup, or job) and the level/s at which the intervention it is evaluated (typically the individual employee). Nevertheless, the multilevel nature of organizations and employee mental health is rarely taken into account in intervention research and practice.

In a comparable timeframe, multilevel approaches have rapidly emerged in the organizational behavior literature, particularly in relation to the construct of organizational climate. Rousseau (1985) pioneered the argument that most of what we study in and about organizations are intrinsically mixed-level phenomena. Organizational climate studies investigate how individuals in a given workgroup might share perceptions about features of their work environment (Burke, Borucki, & Kaufman, 2002) and how these shared perceptions can impact on individual employee outcomes. Contextual determinants of individual behavior in organizations include not only macro level factors (Dollard, Osborne & Manning, 2012; Bamberger, 2008) such as labor market conditions, national culture, the broader political context, but also meso-level social or normative environments captured by workgroup or organizational climate (see also Capelli & Sherer, 1991; Johns, 2006). The meso perspective suggests that because individuals are nested within work groups, which are nested within work organizations, the variability *between* work groups/organizations is as important as variability between individuals *within* work groups in predicting employee mental health.

The aim of this paper is to provide a framework for a multilevel conceptualization of the relationship between the psychosocial work environment, employee mental health and related organizational interventions. The paper commences by providing a rationale for using a multilevel approach to understand these relationships and extending that to a discussion of how

a failure to apply a multilevel approach to related interventions can lead to omission of valuable higher-level resources for intervention implementation and inaccurate inferences on the success of interventions. In order to address these challenges researchers need to be cognizant of a number of important theoretical and empirical issues in designing sound multilevel research. We contend that the literature on organizational climate provides important insights for both methodological and substantive expansion of our understanding in this field of research and present key issues for consideration. The paper concludes with five recommendations to guide future research.

A MULTILEVEL APPROACH TO THE RELATIONSHIP BETWEEN PSYCHOSOCIAL WORK ENVIRONMENT AND EMPLOYEE MENTAL HEALTH

Theoretical models that explore the influence of the psychosocial work environment on employee mental health that have been dominant in the literature include Job-Demands-Control (Karasek, 1979); Effort-Reward Imbalance (Siegrist, 1996), Job-Demands-Resources (Demerouti et al., 2001) and Organizational Justice (Greenberg, 1987). In all four approaches, influences on mental health come from exposure to certain psychosocial features measured as individual employees' perceptions of their job and/or work environment. These theories have developed a strong understanding of discrete influences on mental health at the individual (micro level) but much less is known about the extent to which work experiences are shared among individuals working together (meso level) and the role of environmental features (macro level) (see Figure 1).

By focusing on the individual level, these dominant theories have inadvertently bypassed the important influence of more distal social and organizational determinants of employee mental health (Hall, Dollard, & Coward, 2010a). Features of work may be evaluated similarly by members of a specific work group, organization, or other grouping contexts such as professional group (Dextras-Gauthier, Marchand, & Haines III, 2012). Therefore, in so far as the experience

of work is an important determinant of mental health, it can be expected that some aspects of the work context are similarly experienced by individuals in the same work group or organization, and that these experiences will impact on employee outcomes in different ways than their personal experiences.

The meso-level of analysis, which represents the primary scope for this paper, can be measured as the shared or collective perceptions of individuals working together (Rousseau, 1985). With the exception of a few pioneering studies (Bacharach & Bamberger, 2007; Dollard, Tuckey, & Dormann, 2012; Kolstad et al., 2011; Van Yperen & Snijders, 2000), little research exists on the relationship between collective perceptions of the psychosocial work environment and employee mental health and little understanding of how these levels may interact to influence individual outcomes via cross-level effects. Theoretical developments along these lines are necessary and we hope this paper provides some impetus for this.

INSERT FIGURE 1 ABOUT HERE

A MULTILEVEL APPROACH TO ORGANIZATIONAL INTERVENTIONS

The issues raised above have important implications for the study and practice of organizational interventions, and here we focus on those that aim to address employee mental health. The Theory of Preventative Stress Management (TPSM) provides a framework for organizations to implement primary, secondary and tertiary levels of intervention (Hargrove, Quick, Nelson & Quick, 2011; Quick, Quick, Nelson & Hurrell, 1997). Primary interventions are focused on removing or reducing common job stressors, whereas secondary interventions aim to promote optimal employee responses to them, and tertiary interventions are focused on rehabilitating employees who are already suffering from the consequences of stress at work. The multilevel approach we advocate is not inconsistent with the TPSM, although we note that the single-level focus of mainstream theories of occupational health has resulted in an overemphasis on secondary and tertiary strategies (Bacharach & Bamberger, 2007). Furthermore, the target

and level of interventions are terms that are often confused in the literature. Implementing individual-level interventions does not always equate to secondary and tertiary prevention, just as organizational interventions are not all aiming at primary prevention (Jordan et al., 2003). For example, Pignata, Biron, and Dollard (2014) illustrate how an organizational intervention (e.g. a training policy) can be a secondary-level, if it focuses on improving individuals' capacity to cope with stress, just as an individual intervention (e.g. individual coaching/mentoring on psychosocial risks for line managers) can prevent employee exposure to psychosocial risks and thus be considered as primary-level intervention. However, for the purpose of this paper, we use the term organizational interventions to refer to interventions aiming to change aspects related to work design, work conditions, and psychosocial factors whereas individual interventions refer to any attempt at promoting optimal employee response to stressors. Often, these organizational level interventions have positive effects on individual outcomes, but the results are mixed and this is partly due to how complex their implementation can be (Biron, Karanika-Murray, & Cooper, 2012b; Semmer, 2011). A systematic review by Lamontagne et al. (2007) shows that interventions integrating organizational and individual levels is more effective for reducing target outcomes than a focus on one level only (also see Mellor & Webster, 2013).

An examination of the levels at which organizational and individual interventions can be (a) implemented and (b) evaluated suggests a 2x2 framework. Interventions implemented at the organizational level can be evaluated by targeting either organizational or individual level outcomes. Similarly, interventions implemented at the individual level can also be evaluated by targeting outcomes at either the organizational or individual levels (see Table 1). Intervention targets at the organizational level can include issues that affect all individuals in a workgroup (e.g., policies and procedures, management practices, workplace design characteristics, work design). Intervention evaluation at the organizational level can be based on data from either organizational records (e.g., sickness absence, turnover) or self-report measures that are

aggregated at the group level (e.g., organizational climate, leadership and management of the workgroup/workplace). Intervention targets at the organizational level can include issues that affect each individual uniquely (e.g., personal resilience, coping, specific job characteristics such as work scheduling). Intervention evaluation at the organizational level can take the form of self-report measures of individuals' perceptions, and such intervention criteria typically measured (e.g., affective well-being, performance, job satisfaction, physical health/health behaviours, intervention awareness).

Table 1 presents examples of intervention targets and evaluation foci across different intervention levels. A distinction between levels of intervention implementation and evaluation provides a clearer picture of what is implemented and what can be evaluated. Its absence can lead to two problems than can impact on intervention effectiveness and on how confident we are in its evaluation. Although we have sketched a 2 x 2 framework to describe intervention target and evaluation foci, in this paper we concentrate on organizational-level interventions. Specifically, we now turn to a discussion of how a multilevel approach can help further understanding of the role of collective resources in interventions and improve intervention evaluation.

INSERT TABLE 1 ABOUT HERE

Group-level influences and resources in implementation and evaluation

More often than not, organizational interventions focus on individual-level resources at the omission of group-level or collective resources. This can be problematic. Social psychology tells us that situational factors are important in explaining human behaviour (Mischel, 1968) and research into organizational behavior has repeatedly stressed the importance of the broader work environment for individual attitudes and behaviors (Bamberger, 2008; Johns, 2006, 2010; Rousseau & Fried, 2001). In complex environments such as work organizations, attitudes and behavior are influenced not only by the intended content of the intervention, but also by a range

of other circumstantial and broader environmental influences that may be unrelated to the planned intervention. Contextual influences can include discrete changes, such as changes in the leadership of an intervention project, unexpected organizational changes, the implementation of new organizational structure and any other unexpected reason that can hinder the success of an intervention (Nielsen & Abildgaard, 2013). The overall context of an intervention includes the characteristics of the targets of the intervention and the nature of their jobs, to the forces driving the project, and the broader organizational context (Johns, 2006; Nielsen & Abildgaard, 2013). Similarly, Clegg and Spencer (2007) suggested a dynamic and circular model of job design, which depends on a range of interconnected variables, suggesting that job design can change regardless of whether it is targeted by an intervention or not.

Therefore, a focus on one level in intervention evaluation may miss important available information that can explain intervention effectiveness. As suggested by Biron and Karanika-Murray (2013), contextual factors affecting an intervention's progress vary according to the stage of the intervention, namely the preparation, screening, implementation, and evaluation phase (Goldenhar, LaMontagne, Heaney, & Landsbergis, 2001). Each stage has specific requirements and challenges and also demands different researcher or practitioners skills. Different levels-related issues are relevant at different stages of organizational interventions.

For example, during the preparation phase, influences such as the group's readiness to change or organizational learning culture could be measured as a pre-diagnosis tool in order to determine if these elements are likely to undermine the other phases of the intervention. For example, Biron, Gatrell and Cooper (2010) reported that managers' negative perceptions of a stress risk assessment tool hindered the implementation of changes following the risk assessment phase, which was then associated with decreased employee commitment. Overlooking possible influences of group-level factors or omitting organizational or group-level

outcomes in intervention evaluation can risk missing important information about intervention effectiveness.

In practice, one approach would be to focus on understanding the process and context in which the intervention takes place and the range of contingencies that may impact on its planned implementation, in order to appreciate how and why interventions are effective, for whom and under what circumstances (Biron, Karanika-Murray, & Cooper, 2012a; Nielsen & Abildgaard, 2013; Oakley et al., 2006; Pawson & Tilley, 1997; Saksvik, Nytrø, Dahl-Jorgensen, & Mikkelsen, 2002). Such an examination can also be used to support intervention implementation. For example, although we know that supportive management is essential for the success of interventions (Jauvin, Bourbonnais, Vézina, Brisson, & Hegg-Deloye, 2014; Mellor & Webster, 2013; Nielsen, 2013) there is little if any research on how supportive managers can guide the workgroup through the intervention process. Similarly, resources that naturally reside at the group level (e.g., organizational culture, a climate of resistance to change, and workgroup cohesiveness) can impact not only intervention effectiveness but can also be proactively used to support change at the individual level (Dollard, 2012).

This cross-polarization of resources can be exemplified using the differentiation between intra-individual and inter-individual level resources (Michel, O'Shea, & Hoppe, 2013). It has been suggested that the dichotomy between organizational and individual-level interventions is too simplistic (Briner & Reynolds, 1999). Rather, viewing interventions as focusing on intra-individual resources and/or inter-individual resources allows us to make a clearer distinction between resources that are experienced by each individual uniquely and resources that are shared among individuals working in the same workplace and, in turn, see more clearly how multilevel theory can be applied. Interventions that focus on intra-individual resources include those that aim to change the ways in which people think, manage emotions and motivation and ultimately influence individual behavior, (e.g. coaching, training in stress management, time

management, positive psychology, coping strategies, recovery training). Those that focus on inter-individual resources aim to improve processes and outcomes for multiple individuals including teams and dyads (e.g. supervisor-subordinate exchange relationship, dual earner couples' work-family spillover, team-level psychological capital).

Supervisor support is a shared or collective resource (although some may argue that often, because of the unique relationship between pairs of supervisors and employees, supervisor support is not a uniform resource in a given workplace). Similarly, autonomy and feedback are determined by (the application of) policies and procedures, which are common for all employees and can therefore be considered characteristics of the workplace and shared among individuals working at that given workplace. In both cases, these collective resources should be examined at the appropriate level, that of the workgroup. As Randall and Nielsen (2012) argue, "the fit between the active ingredients of the intervention and the required remedy for a specific presenting problem in a specific context shapes the intervention process and as a consequence intervention outcomes" (p. 121). The extent to which the intervention fits with individuals and with organizational contexts needs to be taken into account when developing action plans. Examples of collective resources include team-level psychological capital (or the positive state of psychological well-being associated with hope, optimism, resilience and self efficacy; Dawkins, Martin, Scott, & Sanderson, 2013; Walumbwa, Luthans, Avey, & Oke, 2011), a climate of trust, work team mission and morale, and a climate of empowerment (Seibert, Silver, & Randolph, 2004).

Another example of recent developments in understanding collective or group level resources is the workplace characteristics model (Karanika-Murray & Michaelaides, 2014). This model is built on the job design, climate, and self-determination literatures and describes the characteristics of the workplace that have a motivating potential. The model incorporates elements of an organization or workgroup's psychological (individual's perceptions of their

shared workplace) and organizational climate (the shared perceptions of individuals of a given workplace), and consists of nine autonomy-, competence- and relatedness-supportive workplace characteristics. These examples highlight the importance of collective resources for individual work outcomes. Although it is recommended that interventions are based on a needs assessment (Cox et al., 2000; Giga, Faragher, & Cooper, 2003), it is rare to find analyses at workgroup factors such as team level or job categories. Nevertheless, we argue that it is safe to contend that individuals' experience of an intervention can vary according to the team that they belong to, their job category, or resources that are shared among individuals in a given workplace.

Shared or group-level constructs can be invaluable (albeit often neglected) intervention resources, but they can also offer new intervention target and foci as well as a different way to evaluate the effectiveness of organizational interventions. Shared resources can provide "the glue" between the higher organizational level at which an intervention is implemented with the lower individual level at which psychosocial effects are expected. For example, although we know that visible senior management support is essential for the success of an intervention, little research exists that can help us to understand how a supportive workgroup supervisor can guide the group through the intervention process.

Mismatch between levels of analysis in intervention evaluation/assessment

Systematic reviews show that individual-level interventions are more successful and sustainable than organizational-level interventions (e.g. Lamontagne et al, 2007). However, as we discuss further below, intervention evaluation that relies on individual level theories and focuses on individual level outcomes will not provide a true picture of intervention effectiveness. Hence, our second observation relates more closely to intervention methodology and specifically on evaluating the success or failure of an organizational intervention. Most of the literature on occupational stress and health interventions focuses on evaluating changes at the job and individual levels (Murphy & Sauter, 2004). Lamontagne, Noblet, and Landsbergis

(2012) also detected a polarization on individual-level evaluation in intervention research. The effectiveness of actions at the organizational or group level is almost always evaluated by assessing target outcomes at the individual level. This tendency, per se, is not necessarily an issue (in practice, practical examples exist where a multilevel approach has been used to evaluate intervention effectiveness). It becomes an issue, however, when individual-level approaches are used to evaluate group level phenomena. This methodological shortcoming can have important implications when making inferences on intervention effectiveness. Not only that, but it may also be responsible for the often weak and inconsistent results of intervention evaluation (Biron et al., 2010; Clegg & Walsh, 2004; Semmer, 2011).

The same construct can acquire a different meaning if assessed as an individual or a group-level variable. It makes intuitive sense to suggest that interventions designed to be implemented at the group level should be evaluated by assessing target outcomes at the group rather than the individual level. In practice, however, as a rule, higher-level shared resources tend to be assessed as individual-level variables, and organizational- or group-level interventions tend to be evaluated in terms of individual-level outcomes. As shown in Figure 1, because individual employees are nested within work groups, which are nested within organizations, individuals working in the same workgroup share common influences. In intervention research and practice, the variability *between* as well as the variability *within* workgroups has to be taken into account. If it is not, incorrect inferences and conclusions about intervention effectiveness may be made

Distinguishing between levels of analysis and a planned effort to take advantage of resources that occur naturally at the group or workplace levels can allow us to draw more informed conclusions about intervention processes and outcomes. It can also help researchers to identify how and what effects intervention activities at one level can be transmitted to target outcomes at different levels. Specifically, it is not possible to expect that the effects of actions at

one level will not be transmitted to other levels (Karanika-Murray & Biron, 2013) and that organizational level interventions are more likely to succeed if supplemented by individual level interventions (Lamontagne et al., 2007). An intervention can incur change simultaneously at various levels of the organization and more comprehensive approaches have more chances of success (Bourbonnais, Brisson, Vinet, Vézina, et al., 2006; Bourbonnais, Brisson, Vinet, Vezina, & Lower, 2006; Brun, Biron, & Ivers, 2006). Semmer (2011) argued that the effects of an intervention will be less predictable as the level increases, because one is dealing with increasingly complex social systems. It is important for intervention research and theory to answer the questions of how an action at the organizational level produces a reaction at the individual level and what ties the two levels together. Some propositions on the nature of change in organizational interventions have been put forward (Karanika-Murray & Biron, 2013), but further work is needed.

It is also possible to evaluate the effectiveness of organizational interventions on the basis of organizational-level outcomes. For example, (Taris et al., 2003) used organizational-level data to identify the types of interventions implemented in 81 agencies. Interviews allowed them to categorize the focus of the interventions into person/work interface-directed, person-directed, and other. To evaluate the effects of these interventions on individuals they aggregated the individual-level data (emotional exhaustion and psychosocial job characteristics) at the agency level to create an index of work-related health risks (i.e. jobs demands, social support, decision latitude).

KEY CONSIDERATIONS IN IMPLEMENTING A MULTILEVEL APPROACH: DIRECTIONS FROM THE ORGANISATIONAL CLIMATE LITERATURE

Readers who wish to adopt a multilevel approach in their work may be wondering what this would mean in more practical terms. A multilevel approach distinguishes between levels of focus and specifies how these levels are related, starting with the individual and successively

larger nested groupings of these individuals. It simultaneously estimates variance in a construct of interest at the individual level that can be attributed to these higher order levels (Klein & Kozlowski, 2000). The routine adoption of multilevel approaches can help to understand how socio-contextual factors can influence employee mental health. Bamberger (2008) observed that advances in statistical methods for multilevel modeling have been associated with "nothing short of a revolution" (p. 839). There are, however, a number of theoretical and empirical complexities related to conducting multilevel research, for which research on organizational climate provides a very useful guide, and we now turn to a discussion of these issues.

It is important to note that although disciplinary differences will exist in implementing such research (e.g., in organizational behavior, education, and epidemiology), cross-fertilization allows new methodologies and theory to be developed. A multilevel research tradition is strong in the educational literature, where variation in academic performance and social adjustment indicators are simultaneously predicted by factors at the student, class, school and socio-economic district levels (Mitchell, Bradshaw, & Leaf, 2010). Similarly in epidemiology, multilevel research aims to quantify the relative contribution of individual- and setting-related variables (e.g., clinics, worksites) to variation in health outcomes (Ukoumunne, Gulliford, Chinn, Sterne, & Burney, 1999), such as, for example, social capital at the community level and mental health at the individual level (De Silva, McKenzie, Harpham, & Huttly, 2005). In organizational behavior, multilevel research typically includes individual, work group/team and organizational level influences on indicators of relevance to organizational effectiveness. As noted recently, the "*multilevel acumen"* of scholars in the field of organizational behavior is considerable in comparison to other disciplines (Rousseau, 2011), having made considerable progress in relation to multilevel theory building, the field of organizational behavior offers a range of techniques for dealing with some of the challenges inherent in multilevel research.

One area of organizational behavior where the multilevel perspective is well developed is organizational climate. Because climate is concerned with the manner in which members experience the social-environmental context in an organization, it is central to many models of organizational behavior (Reichers & Schneider, 1990). Psychological climate is defined as an individual's cognitive representations of organizational features and processes and was originally conceived as a perceptual attribute of the *individual* regarding the organizational context (James & Jones, 1974). Subsequently, the construct of organizational climate was distinguished as a property of the *organization* (Burke et al., 2002). Organizational climate refers to the *shared* perceptions of employees concerning the practices, procedures, and kinds of behaviors that are rewarded and supported in an organization (Schneider, Salvaggio, & Subirats, 2002). As a socially constructed phenomenon, organizational climate processes of "collective sense making" are central (Weick, 1995), such that organizational members use information from the social environments to construct and interpret reality. Most importantly, this process gives rise to properties of organizations and workplaces that can only exist through individual and collective action. As Nicholson (1995) notes, enactment is about "the reification of experience and environment through action" (p. 195). Social information processing theory dictates that organizational members use information from the social environments to construct and interpret reality (Schminke & Kuenzi, 2009).

A range of conditions contribute to developing and reinforcing organizational climate in a given work group. Proximity and similarity of experience facilitate the exchange of information among unit members, which in turn, shapes their experiences and interpretations of events (Li & Cropanzano, 2009). A range of other socio-psychological processes also strengthen group homogeneity in terms of values, attitudes, behaviors, such as third party perceptions of fair treatment of others, cognitive and emotional contagion, and fairness heuristics (Li & Cropanzano, 2009). An organization's structural characteristics, social interaction patterns, and

socialization practices also influence the emergence of organizational climate (Reichers & Schneider, 1990).

Therefore, employees' perceptions about their work are strongly shaped by the ways in which people interact, talk about their work, perceive colleagues' experiences, and learn from each other. Particularly relevant to mental health is the natural inclination for people to discuss ambiguous and emotionally charged events (e.g., relating to justice perceptions), as this information-sharing functions as a support mobilization or coping strategy (Spell & Arnold, 2007). In addition, because different groups within a given organization are likely to develop different climates or meaning regarding events, practices, and procedures, the focus on the work group as the level of analysis takes more prominence. As such, the organizational climate literature can provide insights for developing rigorous multilevel approaches to research focused on work related psychosocial risks to mental health. This can be done substantively, by helping to define, theorize and link higher-level concepts with individual-level outcomes, and methodologically, by guiding researchers on measurement and statistical issues.

Theoretical expansion: Climate as a crucial influence on employee mental health

Whereas psychosocial work environment generally refers to individual exposure to known pathogenic characteristics of the workplace, organizational climate is multidimensional - almost any aspect of the work environment that is subject to employee interpretation can be considered. Climate also refers to individual, group, and organizational constructs, depending on the theoretical perspective. Moreover, scholars have often focused on facet-specific climates, i.e. a "climate for something" (Katz-Navon, Naveh, & Stern, 2005), such as service climate (e.g., (Schneider, 1990; Schneider & Bowen, 1985), safety climate (Katz-Navon et al., 2005; Zohar & Luria, 2006) or absence climate (Schyns, van Veldhoven, & Wood, 2009).

It is important to note that organizational culture and organizational climate are related, but distinct, constructs (Kuenzi & Schminke, 2009). They are both concerned with how

employees make sense of their work environments and play a role in influencing employee mental health. However, organizational climate research, rooted in psychology, has a greater focus on quantitative measurement regarding observable features of the organizational environment. Organizational culture has traditionally had a more anthropological base, often studied qualitatively due to a focus on more abstracted or unconscious foci. Schein (2004) views organizational culture as a multilayered construct that includes artifacts, values, social ideals, and basic assumptions. However, there is also a strong functionalist tradition that considers culture as a measurable organizational characteristic that relates to individual consciousness (see for example Sorensen, 2002). It should be noted that quantitative studies have been carried out linking the Competing Values Framework and the Organisational Culture Profile (OCP) to psychological distress, depression, emotional exhaustion, and well-being (Marchand, Haines III & Dextras-Gauthier, 2013; Dextras-Gauthier et al., 2013). Marchand et al (2013) found that the 'Group' OCP type (represented by values of cohesion, morale, development, communication, cooperation, trust teamwork, participation and openness) predicted greater variance in mental health and well-being outcomes than other culture types such as hierarchical, developmental and rational. Dextras-Gauthier et al., (2012, p. 84) state that "management systems and structures mediate the influence of organizational culture on employee health and quality of work life". We add to their model by focusing in more detail on climate, indicated by how employees perceive these management systems and structures (policies, practices and procedures) and the extent to which employees agree that these activities and features are present (primarily reflected at the meso-level of a multilevel model).

An emerging and particularly relevant facet-specific climate construct is Psychosocial Safety Climate (PSC) (Dollard & Bakker, 2010) which provides a useful example of how the study of organizational climate has relevance to mental health. The proponents of PSC recognize that employee mental health is influenced by senior management practices such as

support for stress prevention, prioritization of psychological health over productivity, organizational communication and organizational participation and involvement (Hall, Dollard, & Coward, 2010b). Changes in PSC at a work unit level have been shown to correspond with changes in employees' psychological distress via job demands of work pressure and emotional demands, indicating that PSC is an important "upstream" factor that may explain the origins of job demands and resources and worker engagement and psychological health (Dollard & Bakker, 2010)

The work environment contains a broad and complex mix of psychosocial job characteristics and social and organizational contexts that can potentially impact on employee mental health (Dollard, Skinner, Tuckey, & Bailey, 2007). Given the importance of the shared work environment and the multitude of organizational climate concepts, it is important to focus our efforts on understanding other facets of the shared workplace and their relevance for employee mental health. A good starting point for this inquiry is individuals' perceptions of their workplace, operationalized as psychological or organizational climate. There are, however, additional aspects of climate and other less subjective variables, which have rarely been examined in relation to mental health. Patterson et al, 2005 published a validated, freely available multi-scale measure that includes 17 different climate scales describing of a wide range of managerial practices and organizational characteristics which can be measured at the individual and group levels (the organizational climate measure - OCM), including those with a focus on 'human relations' such as pressure to produce and employee welfare..

Organizational climate research can help to substantively broaden our understanding of the relationship between the psychosocial work environment, employee mental health and related organizational interventions. Emerging research that looks at relationships between facets of workplace climate and employee mental health can be extended. For example, support and control measured as workplace climate moderate the relationship between experienced

critical workplace incidents and employee psychological distress (Bacharach & Bamberger, 2007). Other facets of climate with supported links to mental health include structure (Spell & Arnold, 2007), efficiency (Arnetz, Lucas, & Arnetz, 2011), leadership (Kelloway & Barling, 2010), equal opportunity (Walsh, Matthews, Tuller, Parks, & McDonald, 2010) and empowerment (Siebert, Silver, & Randolph, 2004).

Greater focus on how organizational and work unit climates develop and the mechanisms through which they impact employee mental health is also needed. Collective experiences of groups of individuals working in a given workplace emerge (Hofmann & Morgeson, 1999) through processes of social interaction and influence, shared norms and values, and shared identity (Karanika-Murray & Biron, 2013), These shared or collective experiences are qualitatively different from individuals' varying personal experiences. A key consideration would be to understand the range of mechanisms that give rise to shared perceptions and experiences.

Methodological expansion: Multilevel research conceptualization and operationalization

Research into the relationships between psychosocial work environment, employee mental health and related organizational interventions can be greatly informed by an understanding of issues routinely discussed in the organizational climate literature, particularly those regarding theorizing, measuring and sampling/analyzing group-level constructs. Although it is outside the scope of this paper to discuss them in detail, we highlight key issues pertaining to improving psychosocial exposure assessment and the theoretical legitimacy and operationalization of collective constructs in multilevel field research.

Reducing reliance on subjective indicators

A contentious issue in the occupational health literature is what is seen as a necessity for objective indicators of psychosocial risks that are "immune" to response bias arising from individuals with mental health problems perceiving their environment more negatively than

individuals without such problems (Kolstad et al., 2011). Although methods using indicators such as organizational records or expert ratings (Waldenstrom et al., 2008) are not inherently bias-free (Kompier, 2005), this quest for more objective data remains.

An alternative to that is aggregation of individual self-reports of work environment to reflect group-level exposure, which is then correlated with employee mental health via self-reported symptom checklists, through diagnostic interviews, or medical records. A recent study showed that when participants were classified for psychosocial risk exposure on the basis of the work-unit's mean levels of risk, the associations observed with mental health were substantially smaller than when individual level exposures were used, indicating a significant problem with reporting bias (Kolstad et al., 2011). Using data aggregated at the work unit level rather than data at the individual level can reduce the potential for response bias and create a more "objective" assessment of the work environment. This is promising, but not without problems as we detail below.

Grounding constructs and their operationalization in theory

When aggregating individual data to reflect group level exposure, researchers need to be cognizant of the potential for the "ecological fallacy" when designing multilevel research. That is, they invoke theories developed to address the relationship between individual-level constructs and simply assume those relationships also hold at higher levels of analysis (Kuenzi & Schminke, 2009; Probst, 2010). Whether constructs at the individual level have similar effects as their group level counterparts is known as conceptual isomorphism. It should not be assumed that measures at the individual and collective levels are conceptually isomorphic (Li & Cropanzano, 2009). For example, individual task significance reflects the degree to which individual respondents perceive their work as meaningful; while group task significance reflects the degree to which members of the group collectively perceive that the group has an important mission (Bliese & Jex, 2002).

These issues highlight the importance of grounding any decisions regarding the contextual parameters to study in theory. Indeed, theory development regarding cross-level effects, or effects between variables residing at different levels of analysis, can be challenging: "bracketing group-level phenomena with concepts from one level "up" and one level "down" is easier to advocate than to execute" (Hackman, 2012, p. 441). It is easier to conceptualize "top-down processes" and, consequently "bottom up or emergence processes" are less frequently examined (Klein & Kozlowski, 2000). Hackman (2012) suggests that the decision on the constructs to assess at the higher and lower levels of analysis can be facilitated by what he terms "informed induction", or drawing upon a rich mix of contextual data to help identify structures and processes at adjacent levels that are most likely to shape, or be shaped by, the phenomenon of interest.

Rousseau (1985) was instrumental in creating awareness of theoretical and empirical issues in multilevel research. Among the important issues she highlighted is aggregation bias (e.g. "extent to which an apparent relationship is an artifact of the data combination method", p.6). Chan (1998) proposed four or ways to represent group-level variables based on aggregation of employee perceptions: additive (variance within groups is not examined - an average is simply assigned), direct consensus (variance is used to establish a certain level of agreement prior to aggregation), referent shift (uses item content referring to the group not the individual) and dispersion models (within group variance is the substantive focus). These models are outlined in Table 2.

INSERT TABLE 2 ABOUT HERE

The direct consensus method is the most widely used in organizational climate studies although the referent shift model is also becoming more popular because it helps to resolve issues of conceptual isomorphism by using survey items with an explicit focus on the group level and because it obtains greater within-group agreement (Li & Cropanzano, 2009). The

dispersion model is also used increasingly in the organizational climate literature because it avoids the problem of using mean scores as a proxy for group-level constructs and thus does not obscure the true distribution of the underlying group member's responses. The use of mean scores (additive model) can result in biased estimates and equivocal findings. Klein et al. (2001) point to "sources of noise" in aggregated group measures, noting that inconsistency between the survey item referent and the level at which the data are aggregated will cloud the interpretation of the results. For example, if the data are aggregated at the higher department or organizational level when the measurement items refer to the work group, the higher-level aggregated variable will not accurately reflect the respondents' frame of reference (Walsh et al., 2010). Kuenzi and Schminke (2009) suggest that a standard has not yet emerged in the climate literature regarding the use of individual referent or referent shift measurement and encourage researchers to address their measurement choices – and their rationale for them – explicitly in their work. They also urge researchers modifying existing scales to take care that the items have a clear and singular focus on the intended level of analysis (Kuenzi & Schminke, 2009). Researchers should consult Cole et al. (2011) for a detailed discussion on the potential for Type I and Type II errors associated with different compositional models.

Measurement bias

Measurement bias is a significant issue in multilevel research, as it is with individual level survey-based methodologies. In epidemiological research, the strength of effects of variables at different levels on the outcome of interest is examined, such that stronger influences from levels higher than the individual are taken to suggest less of an influence of self-reported bias (Ukoumunne et al., 1999). Similarly, in organizational behavior, aggregation is used to reduce individual-level measurement error by averaging random individual-level errors that may result from perceptual bias or other cognitive limitations (Rousseau, 1985). This is particularly relevant in studies using depression as an outcome. However, method variance bias in the

estimation of multilevel relationships can still arise from aggregating self-report measures collected from the same individuals. When group and individual-level variables are derived from different samples, the correlations between group-level climate and employee job satisfaction are reduced, suggesting that cross-level associations can become inflated when individual and group-level ratings are provided by the same individuals (Ostroff et al., (2002). Aggregation of individual scores to form group scores may be insufficient to eliminate this bias (Ostroff et al., 2002). Method variance bias can be minimized by introducing a time delay of 1 month in measures of individual and group-level variables (Ostroff et al., (2002) or by using a split-sample longitudinal multilevel design with two different samples of employees from the same work unit to provide data on work unit climate to those providing data on psychological distress (Dollard et al., 2012). Although challenging to implement, such approaches can provide more reliable findings.

Data analysis

A range of data analysis techniques can be used in multilevel research, including random effects modeling, multilevel latent growth modeling and multilevel structural equation modeling. Before analyzing the data, a range of indicators are commonly examined to inform decisions relating to whether constructing a group-level variable by aggregating individual- or lower-level data is viable. Statistical indicators applied include a within-group agreement index (r_{wg}), an indicator of between group variance relative to total variance in the outcome measure (ICC-1) and an indicator of the extent to which average group ratings can reliably predict variance in the outcome measure (ICC-2). For an extensive discussion see James, Demaree and Wolf (1984) or Klein and Koslowski (2000). It should be noted that some of the established cut-off levels for these statistical indicators have been recently discussed (Cole, Bedeian, Hirschfeld, & Vogel, 2011) and given there is no accepted "one best way" to deal with agreement issues,

researchers are encouraged to provide more than one index of agreement when establishing group level climate constructs (Kuenzi & Schminke, 2009).

Group sampling

In group-level research, obtaining 100% response rates from all groups or teams sampled is practically impossible (Maloney, Johnson, & Zellmer-Bruhn, 2010). Group response rates can vary considerably within one sample and non-response patterns can be random or systematic. For example, systematic non-response in research on team conflict may be related to respondents from teams with high conflict being less likely to respond than those from teams with low conflict. Thus, non-response will be correlated with the variable of interest (Maloney et al., 2010). This is particularly important for research into employee mental health, where poor mental health could both predict systematic non-response and be an outcome of the group-level variable. In addition, determining work group or departmental boundaries can be complex when group membership shifts dynamically but straightforward in traditional intact, stable, and tightly bounded social systems, making it "nearly impossible" in some settings to define group membership (Hackman, 2012, p. 429). Maloney et al. (2010) propose ways to handle non-response in ways that can minimize any effects on the true findings. They recommend more complete reporting of non-response, use of formulas that can correct for non-response bias impacting on ICC and rwg (Newman & Sin, 2009), and collection of more descriptive information on groups (e.g., size, tenure, task, location, group membership and membership stability).

RECOMMENDATIONS FOR FUTURE RESEARCH

In consideration of the argument we have developed in this paper, and the associated theoretical and methodological issues, we propose five key recommendations for developing a multilevel approach to understanding the relationship between the psychosocial work environment, employee mental health and related organizational interventions.

1. Employ research designs that are appropriate to and that respect the nested nature of employee level data.

Employee level data is nested within multiple levels of influences. Routine inclusion of multisource, multilevel data that include a range of approaches to operationalizing psychosocial work environment would be useful. For example, objective data on higher level factors (e.g., organizational characteristics), data derived from independent expert ratings, aggregated work-unit or organizational climate data and individual level data on employee's subjective experience, can all help to take into account a range of multilevel influences on employee mental health.

2. Pay greater attention to both theoretical and empirical justification for group level constructs.

Theoretical development is needed in some areas to incorporate the group level into existing models and frameworks that pertain to the relationship between the psychosocial work environment, employee mental health and related organizational interventions. The extant knowledge on compositional models, procedures for aggregation, and guidelines for reporting of team response rates can contribute towards expanding the focus of research into employee mental health and operationalizing group level exposure.

3. Develop appropriate group-level measures of psychosocial work environment features.

This can be achieved by paying greater attention to possible predictors of within-group agreement on perceptions of the work environment and by examining the effects of item wording and referents. For example, researchers can investigate the circumstances under which team agreement increases or decreases (by using dispersion models or climate strength) and understand which team-level constructs are more susceptive to non-response bias (Maloney et al., 2010). Researchers could also make use of advances such as statistical approaches for correcting for non-response bias, using split samples, or applying a temporal delay in the

administration of measures at different levels. Collecting descriptive information on work teams (e.g., size, tenure, tasks, or location) to examine potential sources of bias could also help to define more homogenous measures.

4. Expand investigations beyond the work group level to the organizational level (and beyond).

There is considerable scope for research into employee mental health to capitalize on multilevel approaches by examining more than two levels. Understanding the extent to which findings are consistent across different organizational contexts – in addition to workgroups within one organization – would be informative. Multilevel models offer the potential to explain substantial variance in employee mental health as a factor of individual, group, or organizational level influences. Expanding investigations to include broader contextual, influences at the industry or country levels would also be informative (Dollard & Neser, 2013). There is considerable variability in how national and regional economies approach worker health both legislatively and in terms of policy frameworks. Other external contingencies may also be relevant. Public sector resource shortages (e.g. cuts in public spending) or intense media spotlight on performance (e.g. social services and education) are likely distal influences on employee mental health. Socio-political, economic and labor market conditions in different industries may also drive organizational climate conditions that influence employee mental health. However, practical considerations to take into account include obtaining data from large numbers of organizations, or multi-country or multi-industry studies, which often requires substantial time, effort, and resources. Particular attention focus should be placed on emerging findings from the organizational climate literature (e.g., structure, efficiency, leadership), as discussed. Furthermore, "trickle-down models" which examine, for example, how each consecutive layer or level of management may influence the next and, in turn, ultimately impact on employee outcomes offer a promising lens (Kuenzi & Schminke, 2009). This could also

include three-level models where factors at two meso-levels are simultaneously examined in relation to their influence on employee mental health.

5. Develop multilevel approaches to intervention design, implementation and evaluation.

By opening avenues for a better understanding of the interactions among individual, job, organizational and even macroeconomic antecedents of employee mental health, the use of more sophisticated multilevel measurement and analysis approaches could also enable the development of more effective interventions (Probst, 2010). We urge intervention researchers to broaden the design and evaluation of interventions by considering multilevel approaches. This is especially important in light of the mixed evidence on the effectiveness of organizational level interventions (Graveling, Crawford, Cowie, Amati, & Vohra, 2008; Martin, Sanderson, & Cocker, 2009). A divergence between the level at which an organizational intervention is implemented (the work group) and the level at which it is evaluated (the individual), and this mismatch may be the source of unreliable or inconsistent evaluation outcomes. Multilevel theory suggests a number of ways in which levels of analysis can be taken into account in organizational intervention research. These include, among others, challenges associated with implementing multilevel research, specifically relating to the fit between theory and measurement or aggregation strategy, sampling, and response rates of groups. Cross-level moderation issues are also relevant here, where, for example, the extent of team agreement about the extent of implementation of an org or team intervention (so-called dispersion models) might moderate the effect of the intervention on individual outcomes (Bliese & Jex, 2002).

Conclusion

The aim of this paper was to outline the advantages of a multilevel approach to improving understanding of the relationship between the psychosocial work environment, employee mental health and organizational interventions. In particular, we argued that consideration of the role of shared experiences and resources of individuals working in a given

workplace may bolster intervention engagement and delivery and ensuring levels of intervention action and intervention evaluation are congruent may also offer more accurate evaluation results. Drawing on organizational climate literature, we illustrated a number of important theoretical and methodological considerations.

We have provided what we hope is an accessible, non-technical overview of a multilevel approach that researchers could adopt in order to progress this field of research. Whilst the inherent challenges of conducting multilevel research should not be underestimated (Kulik, 2011), our recommendations will hopefully help to advance understanding of the relationship between the psychosocial work environment and employee mental health and improve intervention implementation and evaluation. In sum, we remind researchers that employee mental health is determined by a range of factors beyond the individual, that these reside in the broader workplace, organization and society in which work takes place, and that our understanding of employee mental health and interventions that address it will be incomplete if these multiple levels of influences, and the interactions among them, are not taken into account.

REFERENCES

Arnetz, B. B., Lucas, T., & Arnetz, J. E. (2011). Organizational climate, occupational stress, and employee mental health: Mediating effects of organizational efficiency. *Journal of Occupational and Environmental Medicine, 53*(1), 34-42.

Bacharach, S. B., & Bamberger, P. A. (2007). 9/11 and New York city firefighters' post hoc unit support and control climates: A context theory of the consequences of involvement in traumatic work-related events. *Academy of Management Journal, 50*(4), 849-868.

Bamberger, P. (2008). Beyond contextualization: using context theories to narrow the micro-macro gap in management research. *Academy of Management Journal, 51*(5), 839-846.

Barling, J., Loughlin, C., & Kelloway, E. K. (2002). Development and test of a model linking safety-specific transformational leadership and occupational safety. *The Journal of applied psychology, 87*(3), 488-496.

Biron, C., Gatrell, C., & Cooper, C. L. (2010). Autopsy of a failure: Evaluating process and contextual issues in an organizational-level work stress intervention. *International Journal of Stress Management, 17*(2), 135-158.

Biron, C., & Karanika-Murray, M. (2013). Process evaluation for organizational stress and well-being interventions: Implications for theory, method, and practice. *International Journal of Stress Management* (Special issue). doi: 10.1037/a0033227

Biron, C., Karanika-Murray, M., & Cooper, C. L. (2012a). *Improving organizational interventions for stress and well-being: Addressing process and context*. London: Routledge.

Biron, C., Karanika-Murray, M., & Cooper, C. L. (2012b). Organizational stress and well-being interventions : An overview. In C. Biron, M. Karanika-Murray & C. L. Cooper

(Eds.), *Improving organizational interventions for stress and well-being : Addressing process and context.* (pp. 1-17). London: Routledge.

Bliese, P. D., & Jex, S. M. (2002). Incorporating a multilevel perspective into occupational stress research: Theoretical, methodological, and pratical implications. *Journal of Occupational Health Psychology, 7*(3), 265-276.

Bliese, P. D., Jex, S. M., & Halverson, R. R. (2002). Integrating multilevel analyses and occupational stress theory. In P. L. Perrewe & D. C. Ganster (Eds.), *Historical and Current Perspectives on Stress and Health (Research in Occupational Stress and Well-being)* (Vol. 2): Emerald Group Publishing Limited.

Bonde, J. P. E. (2008). Psychosocial factors at work and risk of depression: a systematic review of the epidemiological evidence. *Occupational and Environmental Medicine, 65*(7), 438-445.

Bourbonnais, R., Brisson, C., Vinet, A., Vézina, M., Abdous, B., & Gaudet, B. (2006). Effectiveness of a participative intervention on psychosocial work factors to prevent mental health problems in a hospital setting. *Journal of Occupational & Environmental Medicine, 63*, 335-342.

Bourbonnais, R., Brisson, C., Vinet, A., Vezina, M., & Lower, A. (2006). Development and implementation of a participative intervention to improve the psychosocial work environment and mental health in an acute care hospital. *Occupational And Environmental Medicine, 63*, 326 - 334.

Briner, R. B., & Reynolds, S. (1999). The costs, benefits, and limitations of organizational level stress interventions. *Journal of Organizational Behavior, 20*, 647-664.

Brun, J.-P., Biron, C., & Ivers, H. (2006, March). *Strategic management of prevention programs for occupational stress.* Paper presented at the 6th APA-NIOSH International conference on occupational stress and health, Miami, USA.

Burke, M. J., Borucki, C. C., & Kaufman, J. D. (2002). Contemporary perspectives on the study of psychological climate: A commentary. *European Journal of Work and Organizational Psychology, 11*(3), 325-340.

Capelli, P., & Sherer, P. D. (1991). The missing role of context in OB: The need for a meso-level approach. *Research in Organizational Behavior, 13*, 55-110.

Chan, D. (1998). Functional relations among constructs in the same content domain at different levels of analysis: Typology of composition models *Journal of Applied Psychology, 83*, 234-246.

Clegg, C., & Spencer, C. (2007). A circular and dynamic model of the process of job design. *Journal of Occupational and Organizational Psychology, 80*, 321-339.

Clegg, C., & Walsh, S. (2004). Change management: Time for a change! *European Journal of Work & Organizational Psychology, 13*, 217-239.

Cole, M. S., Bedeian, A. G., Hirschfeld, R. R., & Vogel, B. (2011). Dispersion-composition models in multilevel research: A data-analytic framework. *Organizational Research Methods, 14*(4), 718-734.

Cooper, C. L., Dewe, P. J., & O'Driscoll, M. P. (2001). *Organizational Stress: A Review and Critique of Theory, Research, and Applications*. Thousand Oaks, CA: Sage Publications.

Cox, T., Griffiths, A. J., Barlowe, C. A., Randall, R. J., Thomson, L. E., & Rial-Gonzalez, E. (2000). *Organisational Interventions for Work Stress: A Risk Management Approach* (pp. 193). Sudbury: HSE Books.

Dawkins, S., Martin, A., Scott, J., & Sanderson, K. (2013). Building on the positives: A psychometric review and critical analysis of the construct of Psychological Capital. *Journal of Occupational and Organizational Psychology, 86*(3), 348-370.

de Jonge, J., Bosma, H., Peter, R., & Siegrist, J. (2000). Job strain, effort-reward imbalance and employee well-being: A large-scale cross-sectional study. *Social Science and Medicine, 50,* 1317-1327.

De Silva, M. J., McKenzie, K., Harpham, T., & Huttly, S. R. A. (2005). Social capital and mental illness: A systematic review. *Journal of Epidemiology and Community Health, 59*(8), 619-627.

de Vogli, R., Ferrie, J. E., Chandola, T., Kivimaki, M., & Marmot, M. G. (2007). Unfairness and health: Evidence from the Whitehall II Study. *Journal of Epidemiology and Community Health, 61,* 513-518.

Demerouti, E., Bakker, A. B., Nachreiner, F., & Schaufeli, W. B. (2001). The job demands-resources model of burnout. *Journal of Applied Psychology, 86*(3), 499.

Dextras-Gauthier, J., Marchand, A., & Haines III, V. (2012). Organizational culture, work organization conditions, and mental health: A proposed integration. *International Journal of Stress Management, 19*(2), 81-104.

Diez-Roux, A. V. (1998). Bringing context back into epidemiology: Variables and fallacies in multilevel analysis. *American Journal of Public Health, 88*(2), 216-222.

Dollard, M. F. (2012). Psychosocial safety climate: A lead indicator of workplace psychological health and engagement and a precursor to intervention success. In C. Biron, M. Karanika-Murray & C. C. L. (Eds.), *Improving organizational interventions for stress and well-being interventions: Addressing process and context* (pp. 77-101). London: Routledge.

Dollard, M., & Bakker, A. B. (2010). Psychosocial safety climate as a precursor to conducive work environments, psychological health problems, and employee engagement. *Journal of Occupational Health Psychology, 83*(3), 579-599.

Dollard, M.F., Osborne, K., & Manning, I. (2012). A macro-level shift in modelling work distress and morale, *Journal of Organizational Behavior,* 34, 629-647.

Dollard, M., Skinner, N., Tuckey, M. R., & Bailey, T. (2007). National surveillance of psychosocial risk factors in the workplace: An international overview. *Work & Stress, 21*(1), 1-29.

Dollard, M. F., Tuckey, M. R., & Dormann, C. (2012). Psychosocial safety climate moderates the demand-resource interaction in predicting workgroup distress. *Accident Analysis and Prevention, 45*, 694-704.

Ferrie, J. E., Head, J., Shipley, M. J., Vahtera, J., Marmot, M. G., & Kivimaki, M. (2006b). Injustice at work and the incidence of psychiatric morbidity: The Whitehall II study. *Journal of Occupational and Environmental Medicine, 63*, 443-450.

Giga, S., Faragher, B., & Cooper, C. L. (2003). Identification of good practice in stress prevention/management. In J. Jordan, E. Gurr, G. Tinline, S. Giga, B. Faragher & C. L. Cooper (Eds.), *Beacons of excellence in stress prevention* HSE Research Report 133, pp. 1–45). Sudbury, England: HSE Books.

Goldenhar, L. M., LaMontagne, A. D., Heaney, C., & Landsbergis, P. (2001). The intervention research process in occupational safety and health: An overview from NORA Intervention Effectiveness Research Team. *Journal of Occupational and Environmental Medicine, 43*(7), 616-622.

Graveling, R., Crawford, J. O., Cowie, H., Amati, C., & Vohra, S. (2008). Workplace interventions that are effective for promoting mental well-being: Synopsis of the evidence of effectiveness and cost-effectiveness. Edinburgh: National Institute for Health and Clinical Excellence (NICE).

Greenberg, J. (1987). Reactions to procedural injustice in payment distributions - do the means justify the ends. *Journal of Applied Psychology, 72*(1), 55-61.

Hackman, J. R. (2012). From causes to conditions in group research. *Journal of Organizational Behavior, 33*(3), 428-444.

Hall, G. B., Dollard, M. F., & Coward, J. (2010a). Psychosocial Safety Climate: Development of the PSC-12. *International Journal of Stress Management, 17*(4), 353-383.

Hargrove, M. B., Quick, J. C., Nelson, D. L., & Quick, J. D. (2011). The theory of preventive stress management: A 33-year review and evaluation. *Stress and Health, 27*(3), 182-193.

Hofmann, D. A., & Morgeson, F. P. (1999). Safety-related behavior as a social exchange: The role of perceived organizational support and leader-member exchange. *Journal of Applied Psychology, 84*, 286-296.

Hurrell, J. (2005). Organizational stress intervention. In E. K. J. Barling, & M. Frone (Eds.), (Ed.), *Handbook of work stress.* (pp. 623-647). Thousand Oaks, CA: Sage Publications.

James, L., & Jones, L. (1974). Organizational climate: A review of theory and research. . *Psychological Bulletin, 81*(12), 1096-1112.

James, L. R., Demaree, R. G., & Wolf, G. (1984). Estimating within-group interrater reliability with and without response bias. *Journal of Applied Psychology, 69*(1), 85-98.

Jauvin, N., Bourbonnais, R., Vézina, M., Brisson, C., & Hegg-Deloye, S. (2014). Interventions to prevent mental health problems at work: Facilitating and hindering factors. In C. Biron, R. J. Burke & C. L. Cooper (Eds.), *Creating healthy workplaces: Reducing stress, improving well-being and organizational effectiveness*. Farham, UK: Gower Publishing.

Johns, G. (2006). The essential impact of context on organizational behavior. *Academy of Management Review, 31*(2), 386-408.

Jordan, J., Gurr, E., Tinline, G., Giga, S., Faragher, B., & Cooper, C. (2003). *Beacons of excellence in stress prevention*. Health and Safety Executive Report: RR133. Sudbury, England: HSE Books.

Karanika-Murray, M., & Biron, C. (2013). The nature of change in organizational health interventions: Some observations and propositions. In G. F. Bauer & G. J. Jenny (Eds.), *Salutogenic organizations and change: The concepts behind organizational health intervention research* (pp. 239-258). Dordrecht: Springer.

Karanika-Murray, M., & Michaelides, G. (2014). Integrating job design and climate: Conceptualizing workplace design characteristics. Manuscript under review.

Karasek, R. (1979). Job demand, job decision latitude, and mental strain: Implications for job redesign. *Administrative Science Quarterly, 24*(2), 285-307.

Katz-Navon, T., Naveh, E., & Stern, Z. (2005). Safety climate in health care organizations: A multidimensional approach. *Academy of Management Journal, 48*(6), 1075-1089.

Kelloway, E., & Barling, J. (2010). Leadership development as an intervention in occupational health psychology. *Work & Stress, 24*(3), 260-279.

Klein, K. J., Conn, A. B., Smith, D. B., & Sorra, J. S. (2001). Is everyone in agreement? An exploration of within-group agreement in employee perceptions of the work environment. *Journal of Applied Psychology, 86*(1), 3-16.

Klein, K. J., & Kozlowski, S. W. J. E. (2000). *Multilevel theory, research, and methods in organizations: Foundations, extensions, and new directions.* San Francisco: Jossey-Bass.

Kolstad, H. A., Hansen, A. M., Kaergaard, A., Thomsen, J. F., Kaerlev, L., Mikkelsen, S., .Bonde, J. P. (2011). Job strain and the risk of depression: Is reporting biased? *American Journal of Epidemiology, 173*(1), 94-102.

Kompier, M. (2005). Assessing the psychosocial work environment - "subjective" versus "objective" measurement. *Scandinavian Journal of Work, Environment and Health, 31*, 405-408.

Kuenzi, M., & Schminke, M. (2009). Assembling fragments into a lens: A review, critique, and proposed research agenda for the organizational work climate literature. *Journal of Management, 35*(3), 634-717.

Kulik, C. T. (2011). Climbing the higher mountain: The challenges of multilevel, multisource, and longitudinal research designs. *Management and Organization Review, 7*(3), 447-460. Lamontagne, A. D., Keegel, T., Louie, A. M., Ostry, A., & Landbergis, P. A. (2007). A systematic review of the job-stress intervention evaluation literature, 1990–2005. *International Journal of Occupational and Environmental Health, 13*, 268-280.

Lamontagne, A. D., Noblet, A., & Landsbergis, P. A. (2012). Intervention development and implementation: understanding and addressing barriers to organizational-level interventions. In Biron C., M. Karanika-Murray & Cooper C. L. (Eds.), *Improving organizational interventions for stress and well-being: Adressing process and context*. London: Routledge.

Li, A., & Cropanzano, R. (2009). Fairness at the group level: Justice climate and intraunit justice climate. *Journal of Management, 35*(3), 564-599.

Maloney, M., Johnson, S., & Zellmer-Bruhn, M. (2010). Assessing group-level constructs under missing data conditions: A Monte Carlo simulation. *Small Group Research, 41*(3), 281-307.

Martin, A., Sanderson, K., & Cocker, F. (2009). Meta-analysis of the effects of health promotion intervention in the workplace on depression and anxiety symptoms. *Scandinavian Journal of Work Environment & Health, 35*(1), 7-18.

Marchand A., Haines III, V., Dextras-Gauthier, J. (2013). Quantitative analysis of organizational culture in occupational health research: A theory-based validation in 30 workplaces of the organizational culture profile instrument. *BMC Public Health*, 39(443). doi:10.1186/1471-2458-13-443

Melchior, M., Caspi, A., Milne, B. J., Danese, A., Poulton, R., & Moffitt, T. E. (2007). Work stress precipitates depression and anxiety in young, working women and men. *Psychological Medicine, 37*(08), 1119-1129.

Mellor, N., & Webster, J. (2013). Enablers and challenges in implementing a comprehensive workplace health and well-being approach. *International Journal of Workplace Health Management, 6*(2), 129-142.

Michel, A., O'Shea, D., & Hoppe, A. (2013). Resource-oriented interventions at work: Designing and evaluating interventions to promote well-being and performance. Retrieved December 12, from http://www.psychologie.uni-heidelberg.de/ae/abo/sgm/call.html

Mischel, W. (1968). *Personality and assessment.* New York: Wiley.

Mitchell, M., Bradshaw, C., & Leaf, P. (2010). Student and teacher perceptions of school climate: A multilevel exploration of patterns of discrepancy, 80, 271-279.

Murphy, L. R., & Sauter, S. L. (2004). Work organization interventions: State of knowledge and future directions. *Soz.-Präventivmed, 49*, 79-86.

Newman, D., & Sin, H. (2009). How do missing data bias estimates of within-group agreement? *Organizational Research Methods, 12*, 113-147.

Nicholson, N. (1995). Enactment. In N. Nicholson (Ed.), *Blackwell encyclopedic dictionary of organizational behavior.* (pp. 155-156). Cambridge, MA: Blackwell.

Nielsen, K. (2013). Review Article: How can we make organizational interventions work? Employees and line managers as actively crafting interventions. *Human Relations, 66*(8), 1029.

Nielsen, K., & Abildgaard, J. S. (2013). Organizational interventions: A research-based framework for the evaluation of both process and effects. *Work and Stress, 27*(3), 278-297.

Oakley, A., Strange, V., Bonell, C., Allen, E., Stephenson, J., & Team, R. S. (2006). Health services research: Process evaluation in randomised controlled trials of complex interventions. *BMJ: British Medical Journal, 332*(7538), 413-416.

Ostroff, C., Kinicki, A. J., & Clark, M. A. (2002). Substantive and operational issues of response bias across levels of analysis: An example of climate-satisfaction relationships. *Journal of Applied Psychology, 87*(2), 355-368.

Patterson, West, Shackleton, Dawson, Lawthom, Maitlis, et al. (2005). Validating the organizational climate measure: Links to managerial practices, productivity and innovation. *Journal of Organizational Behaviour, 26*, 379-408.

Pawson, R., & Tilley, N. (1997). *Realistic evaluation*. London: Sage Publications.

Peterson, M., & Wilson, J. F. (2002). The culture-work-health model and work stress. *American Journal of Health Behavior, 26*(1), 16-24.

Pignata, S., Biron, C., & Dollard, M. F. (2014). Managing psychosocial risks in the workplace: Prevention and intervention. In M. Peeters, J. de Jonge & T. W. Taris (Eds.), *People at work: An introduction to contemporary work psychology* (pp. 393-413): Wiley Blackwell.

Probst, T. M. (2010). Multi-level models of stress and well-being. *Stress and Health*, *26*(2), 95-97.

Quick, J. C. (1999). Occupational health psychology: Historical roots and future directions. *Health Psychology*, 18(1), 82-88.

Randall, R., & Nielsen, K. (2012). *Does the intervention fit? An explanatory model of intervention success and failure in complex organizational environments*. In C. Biron, M. Karanika-Murray & C. L. Cooper (Eds.), *Improving organizational interventions for stress and well-being: Addressing process and context*. London: Routledge.

Reichers, A., & Schneider, B. (1990). Climate and culture: An evolution of constructs. In B. Schneider (Ed.), *Organizational climate and culture* (pp. 5-39). San Fransisco: Jossey Bass.

Richardson, K. M., & Rothstein, H. R. (2008). Effects of occupational stress management intervention programs: A meta-analysis. *Journal of Occupational Health Psychology, 13*(1), 69-93.

Rousseau, D. (1985). Issues of level in organizational research: Multilevel and cross-level perspectives. *Research in Organizational Behavior, 7*(1-37).

Rousseau, D. M. (2011). Reinforcing the micro/macro bridge: organizational thinking and pluralistic vehicles. *Journal of Management, 37*(2), 429-442.

Rousseau, D. M., & Fried, Y. (2001). Location, location, location: Contextualizing organizational research. *Journal of Organizational Behavior*, *22*(1), 1-13.

Ruotsalainen, J. H., Verbeek, J. H., Salmi, J. A., M., J., Persternack, I., & Husman, K. (2006). Evidence of the effectiveness of occupational health interventions. *American journal of Industrial Medicine, 49*, 865-872.

Saksvik, P. Ø., Nytrø, K., Dahl-Jorgensen, C., & Mikkelsen, A. (2002). A process evaluation of individual and organizational occupational stress and health interventions. *Work & Stress, 16*(1), 37-57.

Schein, E. H. (2004). *Organizational culture and leadership* (3rd ed.). San Francisco, CA: Jossey-Bass.

Schneider, B. (1990). The climate for service: An application of the climate construct. *Organizational climate and culture* (pp. 383-412). San Francisco: Jossey-Bass.

Schneider, B., & Bowen, D. E. (1985). Employee and customer perceptions of service in banks: Replication and extension. *Journal of Applied Psychology, 70*(3), 423-433.

Schneider, B., Salvaggio, A. N., & Subirats, M. (2002). Climate strength: A new direction for climate research. *Journal of Applied Psychology, 87*(2), 220-229.

Schyns, B., van Veldhoven, M., & Wood, S. (2009). Organizational climate, relative psychological climate and job satisfaction: The example of supportive leadership climate. *Leadership & Organization Development Journal, 30*, 649-663.

Seibert, S. E., Silver, S. R., & Randolph, W. A. (2004). Taking empowerment to the next level: A multiple-level model of empowerment, performance, and satisfaction. *Academy of Management Journal, 47*(3), 332-349.

Semmer, N. (2011). Job stress interventions and organization of work. In J. C. Quick & L. E. Tetrick (Eds.), *Handbook of Occupational Health Psychology* (2nd ed., pp. 299-318). Washington, DC: APA.

Siebert, S., Silver, S., & Randolph, W. (2004). Taking empowerment to the next level: A multiple-level model of empowerment, performance, and satisfaction. *Academy of Management Journal, 47*(3), 332-349.

Siegrist, J. (1996). Adverse health effects of high-effort/low-reward conditions. *Journal of Occupational Health Psychology, 1*, 27-41.

Sorensen, J. B. (2002). The strength of corporate culture and the reliability of firm performance. *Administrative Science Quarterl*y, 47, 70–91.

Spell, C. S., & Arnold, T. J. (2007). A multi-level analysis of organizational justice climate, structure, and employee mental health. *Journal of Management, 33*(5), 724-751.

Stansfeld, S., & Candy, B. (2006). Psychosocial work environment and mental health: A meta-analytic review. *Scandinavian Journal of Work Environment & Health, 32*(6), 443-462.

Taris, T. W., Kompier, M. A. J., Geurts, S. A. E., Schreurs, P. J. G., Schaufeli, W. B., de Boer, E., Wattez, C. (2003). Stress management interventions in the dutch domiciliary care sector: Findings from 81 organizations. *International Journal of Stress Management, 10*(4), 297-325.

Ukoumunne, O., Gulliford, M., Chinn, S., Sterne, J., & Burney, P. (1999). Method for evaluating area-wide and organisation-based interventions in health and health care: A systematic review. *Health Technology Assessment, 3*(5).

Van Yperen, N. W., & Snijders, T. A. B. (2000). A multilevel analysis of the demands-control model: Is stress at work determined by factors at the group level or the individual level? *Journal of Occupational Health Psychology, 5*, 182–190.

Waldenstrom, K., Ahlberg, G., Bergman, P., Forsell, Y., Stoetzer, U., Waldenstrom, M., & Lundberg, I. (2008). Externally assessed psychosocial work characteristics and diagnoses of anxiety and depression. *Occupational and Environmental Medicine, 65*(2), 90-97.

Walsh, B. M., Matthews, R. A., Tuller, M. D., Parks, K. M., & McDonald, D. P. (2010). A multilevel model of the effects of equal opportunity climate on job satisfaction in the military. *Journal of Occupational Health Psychology, 15*(2), 191-207.

Walumbwa, F. O., Luthans, F., Avey, J. B., & Oke, A. (2011). Authentically leading groups: The mediating role of collective psychological capital and trust. *Journal of Organizational Behavior, 32*(1), 4-24.

Weick, K. E. (1995). *Sense making in organizations*. Thousand Oaks, CA: Sage.

Ylipaavalniemi, J., Kivimaki, M., Elovainio, M., Virtanen, M., Keltikangas-Jarvinen, L., & Vahtera, J. (2005). Psychosocial work characteristics and incidence of newly diagnosed depression: a prospective cohort study of three different models. *Social Science & Medicine, 61*(1), 111.

Zohar, D., & Luria, G. (2006). A multilevel model of safety climate: Cross-level relationships between organization and group-level climates. *Journal of Applied Psychology, 90*(4), 616-628.

Table 1. A breakdown of levels of analysis (intervention implementation) across intervention target outcome, and intervention evaluation foci

Level of intervention implementation	Intervention target (content) – examples:	Intervention evaluation foci (criterion) – examples:
Organizational	Policies and procedures Management practices	Individual level: Awareness, leadership perceptions Organizational level: org. absence records, leadership perceptions
Workgroup	Climate (generic or domain-specific) Workplace characteristics	Individual level: Personal experiences or evaluation of the workplace Organizational level: Absence records
Job	Job characteristics	Individual level: Evaluations
Individual	Personal resilience, coping, stress management	Individual level: Well-being Organizational level: Collective well-being, efficacy, morale

Table 2: Summary of key compositional models for aggregating individual level data to the meso level.

Compositional model	**Operationalizes the collective construct as:**	**Example**
Additive	The sum or average of lower level scores regardless of the level of agreement among members in of the group	There is no 'climate' but a collection or summary of individual level opinions
Direct consensus	A certain level of agreement is a prerequisite for aggregation and then each member is assigned the average for the group. Primarily concerned with the level or amount of the construct of interest e.g. fairness	Survey measure at the individual level e.g. "I can count on my supervisor to have fair policies".
Referent shift	As per the direct consensus method but the referent is the group not the individual (e.g. we not I)	Survey measures "Have people in your department been able to express their views and feelings about those procedures".
Dispersion	A measure of variability. Primarily concerned with the extent to which members agree or disagree. The level of agreement is not a prerequisite but the focal construct i.e. climate strength.	When contextual factors within the organization or unit may create variations across different units in the construct of interest.

Based on information provided in (Li & Cropanzano, 2009).