

Expanding the Psychosocial Work Environment: Workplace Norms and Work–Family Conflict as Correlates of Stress and Health

Tove Helland Hammer
Cornell University

Per Øystein Saksvik, Kjell Nytrø, and
Hans Torvatn
Norwegian University of Science and Technology

Mahmut Bayazit
Cornell University

This study examined the contributions of organizational level norms about work requirements and social relations, and work–family conflict, to job stress and subjective health symptoms, controlling for Karasek’s job demand–control–support model of the psychosocial work environment, in a sample of 1,346 employees from 56 firms in the Norwegian food and beverage industry. Hierarchical linear modeling analyses showed that organizational norms governing work performance and social relations, and work-to-family and family-to-work conflict, explained significant amounts of variance for job stress. The cross-level interaction between work performance norms and work-to-family conflict was also significantly related to job stress. Work-to-family conflict was significantly related to health symptoms, but family-to-work conflict and organizational norms were not.

The psychological and social conditions people experience in the workplace, often referred to as the psychosocial work environment, have become a regular component in studies of stress and occupational health (e.g., Johnson & Hall, 1996; Johnson & Johansson, 1991; Kasl, 1996, 1998; Theorell & Karasek, 1996). Among theories of stress are a set of models that focus especially on the effects of psychosocial work environment factors on mental strain and physical illness (see Cooper, Dewe, & O’Driscoll, 2001; Ivanevich & Matteson, 1980; Kahn & Byosiere, 1992; Koslowsky, 1998). These are sometimes identified as models of the psychosocial work environment. Some have a narrow focus on job characteristics; others include broader social and economic factors.

Early research by Gardell (1977) on the influence of social factors on disease etiology led him to argue that one should search for the causes of biological

and social pathologies in the structure of work organizations and the organizational resources employees were given to meet job demands. In the more narrow demand–control model developed by Karasek (1979) and Karasek and Theorell (1990), the demands workers experience at the point of production interact with the opportunities they have to influence work tasks and procedures to create different levels of stress. High job demands, in the form of workloads and time pressures, coupled with lack of control are likely to lead to mental strain and cardiovascular disease, particularly when social support is low. A model of the relationship between person–environment fit and stress is focused on the degree to which employees’ skills, needs, and expectations match what employers require and provide (Caplan, 1987; Edwards, 1991, 1996). In a more recent model, Siegrist (1996) identified the imbalance employees experience between high work effort and low rewards, lack of promotional opportunities, and job insecurity as important sources of stress and other negative health effects.

It is the demand–control model that has received most of the attention in studies of stress and ill health (see Kasl, 1996; Kristensen, 1996). Despite its frequent use, however, the model and its measure, the Job Content Questionnaire (JCQ; Karasek et al., 1998), is considered by many to be too narrowly focused on the characteristics of the job itself to the exclusion of other relevant variables that determine workplace experiences, such as individual characteristics, work processes, group or organizational level

Tove Helland Hammer and Mahmut Bayazit, New York State School of Industrial and Labor Relations, Cornell University; Per Øystein Saksvik and Kjell Nytrø, Department of Psychology, Norwegian University of Science and Technology, Trondheim, Norway; Hans Torvatn, SINTEF, Industrial Management, Norwegian University of Science and Technology.

Mahmut Bayazit is now at Koc University, Istanbul, Turkey.

Correspondence concerning this article should be addressed to Tove Helland Hammer, New York State School of Industrial and Labor Relations, Cornell University, 383 Ives Hall, Ithaca, NY 14853-3901. E-mail: thh2@cornell.edu

variables, and social and economic environmental factors (de Rijk, le Blanc, Schaufeli, & de Jonge, 1998; Kasl, 1998; Kristensen, 1995; Landsbergis et al., 2000; Söderfelt et al., 1997; Van der Doef & Maes, 1999; Van Yperen & Snijders, 2000).

We agree with the argument that the psychosocial work environment extends beyond the characteristics of the job itself, and we suggest that new research should focus on the nature and quality of workplace norms. Our argument is based on the assumption that the psychosocial work environment evolves from social and interpersonal relations between organizational actors; that it is a result of formal and informal interactions and negotiations among employees and between employees and management. Through these interactions and negotiations a set of norms develop that govern organizational members' relations to one another and to the organization, and influence their job-related attitudes and behaviors. In the study reported here, we tested an expanded model of the psychosocial work environment in which we examined the contributions of organizational norms and relations at the work-family interface to job stress and health symptoms.

Workplace Relations as Organizational Norms

Norms are taken-for-granted beliefs about how people should think and behave (Homans, 1992). Organizational norms are unwritten rules that prescribe the ways in which all members of an organization should approach their work and interact with one another. They are collectively agreed-upon behaviors, attitudes, and beliefs that give employees a shared meaning or understanding of the workplace and their roles in it (e.g., Cooke & Rousseau, 1988; Dyer, 1986; Schein, 1992). People may not know how and why a given set of norms originated, but they understand the obligations implicit in the norms and the expectations placed on their behavior. The strength of any one set of norms will put pressure on, or constrain, people's behavior. When others' expectations are inconsistent with one's personal preferences, or conflict so that the fulfillment of one set of expectations prevents one from meeting other sets, the result is psychological tension, which can create stress (Katz & Kahn, 1978).

The domain of behaviors covered by norms will differ across organizations, but implicit rules about work performance, attendance, commitment, social relations, and interaction patterns will exist in most workplaces. In this study we focus on norms governing work performance, including pressures for attendance and commitment to the job, and social relations

because they are firm level parallels to job demands and social support, respectively, in the Karasek model. The norms are not the organizational level equivalents of job demands and social support, however. They cover a broader set of demands about a wider variety of behaviors than what employees will experience as they carry out their individual jobs. The job demands in the Karasek model refer to requirements in the execution of individual jobs, whereas an organizational work performance norm describes the nature of the exchange relationship between employer and employees in the form of prescriptions for, and expectations of, behaviors that relate to the employee's contribution to overall organizational performance. Examples of the latter are expectations about employees' contributions of effort and time, quality and quantity of work performance, pressure for attendance, or encouragement of competition between peers for rewards. Social support in the Karasek model refers to help from, and acceptance by, one's coworkers and immediate supervisor. Norms governing the nature of social relations can include expectations about how organizational members should respond to requests for help and support regarding the job, but norms will also spell out how employees and managers should react to, and interact and work with, others throughout the organization.¹

We hypothesize that the expectations and perceived obligations employees experience through strong work performance norms will create psychological pressure or tension that will contribute to job stress and poor health, over and above the effects of job demands, control over work, and social support. Norms governing social relations that emphasize cooperation with, sensitivity to, and support for others, and mutual trust and respect should create a workplace with low interpersonal tensions and therefore be negatively related to job stress and health problems. Such norms might also act as a psychological buffer against excessive performance pressures by making the organizational demands appear more tolerable in a less oppressive social environment.

Organizational policies, practices, and norms can also regulate how employees behave outside the organization's boundary. We believe that research on the psychosocial work environment should also ex-

¹ There is a paucity of conceptual models available to guide research on organizational norms, but what we are describing as work performance and social relations norms is similar to the norms identified in Cooke and Rousseau's (1988) model of "aggressive" and "constructive" organizational cultures, respectively.

amine how organizational level properties can shape the relationship between work and nonwork role conflict and individual level job outcomes, and we therefore include in this study an examination of the work–family interface.

Relations at the Work–Family Interface

There is growing empirical evidence that boundaries between work life and family life are blurred as the behavioral and attitudinal norms of the workplace encroach on nonwork life and relationships, contributing to conflicts between the demands of work and family roles (e.g., Barling, 1992; Ironson, 1992; Kelloway, Gottlieb, & Barham, 1999; Voydanoff, 2002). Work–family conflict occurs when the pressures from the work and family domain are incompatible, in the sense that having to attend to one set of demands prevents one from being able to attend to the other set. Both the time and energy required to fulfill one set of the expectations (a resource drain effect) and the strain experienced in doing so (a spillover effect) impair the fulfillment of the other set of expectations (Greenhaus & Beutell, 1985).

The work–family interface contains two components, work-to-family and family-to-work conflict, that have different origins and different effects (Frone, 2003). For example, Frone, Yardley, and Markel (1997) found that while work distress (e.g., negative emotional reactions to daily work experiences) was caused by family demands interfering with the employee's ability to meet the expectations of the work role, work distress was an immediate antecedent of work-to-family conflict because it reduced the employee's ability to meet family role expectations. We agree with Frone's (2003) argument that there can be direct spillover and resource drain effects of job distress or dissatisfaction on the ability to meet family role expectations. However, we believe that the experience of feeling unable to meet family role obligations due to the time and energy required in the work role is also a source of job stress resulting from the anxiety and frustration the employee experiences when cognitively searching for solutions to the conflict while at work. In this search, the employee may come up short, particularly when the demands of the work role are a prominent feature of the work environment.

Because norms that emphasize job performance, attendance, and organizational commitment accentuate the expectations that employees place the demands of their work role ahead of demands from nonwork roles, we expect work-to-family conflict to

be more salient, and have a greater effect on job stress, in organizations with strong work performance norms. In other words, employees who are embedded in strong performance norms will be more aware of how the work demands will prevent them from meeting family obligations. The heightened awareness itself is likely to cause increasing levels of strain. We therefore expect that the relationship between work-to-family conflict and job stress will be stronger in organizations with strong work performance norms.²

Hypotheses

Our basic argument is that organizational level norms and conflict at the work–family interface will contribute significantly to employee job stress and health problems, over and above the effects of job demands, control over work, and social support. In each of the following hypotheses we predict relationships controlling for effects of the Karasek model:

Hypothesis 1a: Work performance norms will be positively related to employee job stress and subjective health problems.

Hypothesis 1b: Social relations norms will be negatively related to employee job stress and subjective health problems.

Hypothesis 1c: The relationships between work performance norms and employee job stress and subjective health problems will be stronger in firms with poor social relations norms.

Hypothesis 2a: Work-to-family conflict and family-to-work conflict will be positively related to employee job stress and subjective health problems.

Hypothesis 2b: The relationships between work-to-family conflict and employee job stress and subjective health problems will be stronger in organizations with high work performance norms.

Levels of Analysis

Organizational norms are a part of the social context in which people work and as such a shared

² Owing to the domain-specific nature of the moderator, work performance norms, this interaction applies to work-to-family and not to family-to-work conflict.

experience. In models of workplace stress, the psychosocial work environment is comprised of variables from the individual, workgroup, and organizational level. To match the conceptual analyses, research on both the psychosocial work environment and job stress should use multilevel models (see Bliese & Jex, 2002). Karasek and Theorell (1990) recognized that the psychosocial work environment is a group, or organization, level variable—a property of the context in which the individual works. Job demands, decision latitude, and social support are seen as conditions experienced by all individuals who work within a given work setting. The JCQ measures these variables at the individual level, however, in the form of the individual employee's subjective assessments. In the tests of the Karasek model, data have, with few exceptions, been treated as individual level phenomena. Of course, people who share the same work environment may not experience, perceive, and react to it exactly the same way—that is, there will be individual differences in responses—but part of the variance in individual responses should be determined by their shared experiences. A study by Van Yperen and Snijders (2000) showed that a significant amount of the variance in employees' assessment of job demands and decision latitude could be attributed to group level factors, that is, the job task requirements and opportunities for control established by the organization at the work unit level. Not surprisingly, however, given the focus of the JCQ on the individual's experiences with the job, most of the variance in job demands and control was due to individual differences at the employee level. Similar results have also been reported by de Jonge, van Breukelen, Landeweerd, and Nijhuis (1999).

Because the components of the psychosocial work environment are unit properties, the focus of measurement should be at the unit, or context, level. If we are measuring characteristics common to all employees in the unit, such as group performance or attendance norms that have emerged over time from individual members' beliefs, values, and experiences, they should be measured at the individual level, but with a reference to what happens at the unit level and not what is happening to the individual respondent (Klein, Danserau, & Hall, 1994; Kozlowski & Klein, 2000). When aggregating such data to the unit level, one assumes that the aggregate is a more accurate indicator of the organizational characteristic one wants to assess than individual level data because the aggregate measure does not contain the idiosyncratic variance of individual perceptions (Bliese & Jex, 2002). In this study, we measured organizational

norms at the individual level but with a reference to the respondents' situation in their firms, not to what was happening to themselves as individuals, and the data were aggregated to the firm level. Job demands, decision latitude, and social support, however, were measured according to the Karasek model, with items from the JCQ, supplemented with other measures.

Method

Sample and Procedures

The data for this study came from surveys completed by 1,346 employees from a sample of 56 firms in the food and beverage industry in Norway. The study was done under the auspices of the Norwegian Directorate of Labour Inspection, whose function it is to monitor the work environment nationwide. The sample was drawn to be representative of the industry. Firms in our sample varied in size (i.e., number of employees) between 3 and 450, with a mean of 198. The response rate across firms ranged from 12% to 100%, with a mean of 58%.

Forty-three percent of the sample were women. The average age of all respondents was 38.12 years ($SD = 11.85$), and average firm tenure was 10.74 years ($SD = 9.02$). Ninety-one percent of the sample were employed full time; the rest were part-time and temporary employees. On average, they worked 36.33 hr ($SD = 7.32$) per week. Sixty-seven percent worked fixed daytime hours; the rest worked shifts. Fifty-eight percent were hourly or piece-rate workers; the rest were paid by the week. In terms of education, 30.3% had completed 7 to 9 years of schooling, 59.8% had a high school degree, and 9.8% had completed 1 or more years of trade school or college.

The questionnaires were distributed and collected by local labor inspectors from the Directorate. All inspectors knew the enterprises well and had received information about, and training in, the use of a standardized procedure for survey distribution and collection from the researchers. Completed questionnaires were sent directly to the researchers, not to the Directorate's office. This was done because the Directorate of Labour Inspection can use sanctions against employers when aspects of the work environment is not to up to code, and employers could have refused to participate in the study if a neutral party had not been the recipient of the questionnaires. Managers were also interviewed as part of the research and provided firm level statistics about unionization levels, health and safety provisions, accident rates, and firm size. Of these, firm level size was used in the study as a control variable.³

Measures

The demands–control–support dimensions were measured by, or based on, items from the JCQ (Karasek et al.,

³ Of these data, only the health and safety provisions and accident rates could, in theory, be related to employee well-being. None were significantly related to employee job stress and health problems, however. We included size as a control variable only because we had an unbalanced design.

1998) and a short version of the Quality of Employment Survey (QES; described in Theorell, Michélsen, Nordemar, & Stockholm Music 1 Study Group, 1991). Items for this study were selected in part based on the results of a study that examined the validity and reliability of the JCQ and QES (Landsbergis et al., 2000). We chose the items that were the highest contributors to the inter-item reliability of their respective scales.

Job demands. Job demands were measured with four items from the JCQ and QES that assessed how often respondents have to work fast, work with short deadlines, work with constant time pressure due to heavy workloads, and have work that demands constant attention. Scale reliability was .77. The response categories were given on a 5-point scale ranging from *very seldom* to *very often*.

Job control. Job control was measured with two items: "How often can you influence decisions about your own work?" and "How often can you determine how your work should be executed?" Scale reliability was .78. The response categories were given on a 5-point scale ranging from *very seldom* to *very often*.

To measure social support, we had selected two items from the JCQ that represented the core of the original eight-item scale, assessing supervisor and coworker support, but these were not correlated and could not be used as reliable indicators of social support. To avoid using two one-item measures, we constructed two social support scales from other items in our survey, matching these as closely as possible to the original JCQ items. Because we believed that social support from coworkers and leaders could have different effects on job stress and health indicators, we separated the construct into two variables.

Leader support. Support from supervisor was defined by two items: "My supervisor is supportive when I face difficulties or is upset about something" and "My supervisor offers advice or help when I need it to do my job." Scale reliability was .75. The response categories for the items in this scale were given on a 5-point scale ranging from *very seldom* to *very often*.

Coworker support. Support from coworkers comprised the following five items: "I receive help and support from my coworkers," "I feel I am accepted in my work group," "My coworkers are understanding if I have a bad day," "My coworkers back me up when I need it," and "I feel comfortable with my coworkers." Scale reliability was .83. These items were measured with 5-point verbally anchored scales, ranging from *strongly disagree* to *strongly agree*.

Work-to-family conflict and family-to-work conflict. These variables were measured with four items from the Whitehall II study questionnaire (Marmot et al., 1991). Three work-to-family conflict items assessed whether problems at work interfere with home and family life. Scale reliability was .71.

Family-to-work conflict measured whether the demands of family and spouse (partner) interfere with the respondent's job. Five-point scales were used with alternatives ranging from *strongly disagree* to *strongly agree*.

The scales measuring work performance and social relations norms were developed from a factor analysis of items describing the behavioral norms of conduct that operate in the workplace. The measures used 5-point scales with response alternatives ranging from *strongly disagree* to *strongly agree*.

Work performance norms. Work performance norms were measured with six items capturing the organization's expectations of productivity, competition, and loyalty: "In this company, a person's productivity is the only thing that counts," "This company owns you, skin and all," "Here, only the strongest ones survive," "People who are not productive are told to shape up or look for a new job," "In this company, people are expected to come to work regardless of how they feel," and "Employees who are absent are viewed as disloyal." Scale reliability was .80.

Social relations norms. Social relations norms were measured with five items: "Everyone—high and low—is treated with respect in this company," "In this company, we feel we are valued," "There is mutual trust between management and employees," "In this company, people help one another with personal problems," and "In this company, people are encouraged to experiment with new ways to do things." Scale reliability was .78.

Job stress. Job stress was measured with Cooper's Job Stress Scale (Cooper, 1981), which consisted of 22 questions each rated on a 6-point scale with response alternatives ranging from *no stress at all* (0) to *a great deal of stress* (5). The instrument consists of four subscales: work, communication, leadership, and relocation. A summed scale of all the 22 items, job stress, had a Cronbach's alpha of .92. High scores on this variable indicate increasing levels of stress.

Subjective health symptoms. Subjective health symptoms was measured with a scale used in The Second European Survey on Working Conditions (European Foundation, 1997). This index consists of 20 questions regarding frequent somatic and psychological complaints experienced during the last 30 days. Response alternatives ranged from *not troubled* (4) to *seriously troubled* (1). Scale reliability was .87. High scores on this variable indicate better health.

The questionnaire also contained demographic information, used as control variables, and questions about aspects of the work environment not included in this study, such as the physical working conditions.

Statistical Analyses: Model Descriptions

In our data individuals are clustered within firms. To examine the level of nonindependence in the data, we calculated intraclass correlations, ICC(1) (Shrout & Fleiss, 1979) for the two outcome variables. ICC(1) values were 12.7% for job stress and 6.2% for health symptoms, indicating significant mean differences in job stress and health symptoms between firms in our sample.

We tested two hierarchical linear models (HLM; Raudenbush & Byrk, 2001) with two levels, one with job stress as the outcome variable and the other with subjective health symptoms as the outcome variable. For each model, Level 1 is the individual level, which contains four control variables, six explanatory variables, and three interaction terms, and Level 2 is the firm level, which contains organizational size as a control variable, two explanatory variables, and two interaction terms.

At the first step, we entered four individual level control variables into the equation: gender, age, years of education, and tenure. To examine if the slopes should be specified as random or fixed at Level 2, we compared a model with fixed slopes with another model with random slopes using the deviance statistics. Results (not reported here, available on

Table 1
Descriptive Statistics, Intraclass Correlations (ICCs), and Correlations for Explanatory and Outcome Variables

Variable	<i>M</i>	<i>SD</i>	ICC(1)	ICC(2)	1	2	3
1. Gender	1.57	0.50			—	.13	.15
2. Years of education	2.82	0.65			.11	—	.05
3. Age	38.12	11.85			-.04	-.21	—
4. Tenure	10.74	9.02			.12	-.18	.61
5. Organizational size	4.67	1.29			.06	.03	-.13
6. Family-to-work conflict	1.52	0.94	.04	.51	.06	.17	-.09
7. Work-to-family conflict	2.07	0.96	.08	.67	.05	.14	-.08
8. Job control	2.85	1.17	.05	.54	.10	.19	.05
9. Job demands	3.80	1.22	.12	.75	-.01	-.04	-.01
10. Coworker support	4.23	0.72	.05	.55	-.11	.02	.07
11. Leader support	3.10	1.04	.05	.56	-.11	.04	-.02
12. SR norms	3.34	.88	.09	.69	-.07	-.01	.15
13. WP norms	2.39	.82	.10	.73	.08	-.01	-.04
14. Job stress	2.25	.86	.13 ^a	.64	.06	.12	-.07
15. Health symptoms	3.48	.38	.06 ^a	.42	-.01	.15	-.07

Note. Numbers below the diagonal represent individual level correlations; $N_i = 1,282-1,337$; $r > .06$ are significant at the .05 level, $r > .07$ are significant at the .01 level. Numbers above the diagonal represent group level correlations; $N_g = 56$; $r > .26$ are significant at the .05 level, $r > .34$ are significant at the .01 level. Means and standard deviations are at the individual level. Gender: female = 1, male = 2; Organizational size is ln transformed. SR norms = social relations norms; WP norms = work performance norms.

^a ICC(1) values are range from -1 to +1 (analysis of variance formula) except for job stress and health symptoms, which range from 0 to +1 (random coefficient model formula).

request) indicated that the slopes of the control variables did not vary significantly for job stress or health symptoms. We therefore estimated them as fixed effects (not random at Level 2) in our models.

In the second step for both models, we added four individual level explanatory variables and two interaction terms to the equation: the Karasek model variables of job demands, job control, support from coworkers, support from supervisor, and the interaction terms of job demands with job control, and coworker support.⁴ Consistent with our aim of using the Karasek model as a baseline at Level 1, we centered all six variables around their grand mean.⁵ As was the case with the demographic control variables, the slopes did not show significant variance across firms indicated by the multiparameter likelihood ratio test. Therefore, all seven variables added to the models in the second step were treated as fixed effects.

In the third step, two variables—work-to-family conflict and family-to-work conflict—were added as individual level explanatory variables. Although both of these variables are at the individual level (assuming each employee has a different family), they could contain a significant amount of between-firms variance because there may be meaningful differences between firms on family friendly policies and practices. We therefore centered both conflict variables around their sample mean (i.e., grand-centering), essentially allowing them to explain variance in both levels. These variables were treated as random effects at Level 2 in the job stress model only, because estimating variance and covariance components for their slopes increased the model's fit.

The fourth and the final step in our analysis was the

estimation of Level 2 coefficients. We used three firm level variables, firm size, work performance norms, social relations norms, and the interaction between these norms, to model the Level 2 variance in the intercept. We also examined the cross-level interaction hypothesis between work-to-family conflict and work performance norms by predicting the slope of the work-to-family conflict in the job stress model. We centered all Level 2 explanatory variables around their sample mean (i.e., grand-centering) to allow us to interpret the Level 2 intercept.

We estimated the models using full maximum likelihood estimation method to make model fit comparisons using the

⁴ We ran all two-way and three-way interactions and retained only those interactions that were significant.

⁵ Other researchers have chosen to use two variables—one group-centered variable (i.e., no between-levels variance) and another variable representing the group means (i.e., no within-level variance)—to capture variance in different levels of analysis. However, use of group centering is meaningful only in the case when the researcher is interested in how group members' deviation from the group average is related to the dependent variable (i.e., frog pond effect). Furthermore, group means may not be reliable enough to differentiate groups from each other (i.e., ICC(2) is low). Therefore we believe that estimating the overall effects of job demands and support from leader with raw scores or grand-centered scores is the best approach.

4	5	6	7	8	9	10	11	12	13	14	15
.27	.03	.19	.07	.05	-.07	-.02	-.07	.05	.02	-.24	.20
.03	.26	.31	.28	.31	.12	.22	-.11	-.07	-.13	.29	.07
.52	-.22	.13	.16	-.08	-.16	-.06	-.20	-.12	.14	.01	-.27
—	.12	-.10	.14	-.11	-.02	-.06	-.27	-.35	.27	.20	-.25
.09	—	-.12	.05	-.34	.30	-.18	-.05	-.42	.17	.36	-.21
-.05	-.02	—	.75	.11	.45	-.26	-.11	.05	.35	.38	-.38
.01	-.01	.39	—	.07	.49	-.43	-.20	-.27	.53	.65	-.57
.07	-.10	-.06	.01	—	.00	.47	-.02	.18	-.25	-.04	.25
.03	.13	.07	.19	-.12	—	-.17	-.15	-.11	.44	.49	-.50
-.01	-.07	-.10	-.26	.28	-.13	—	.26	.47	-.43	-.32	.42
-.05	-.03	-.01	-.10	.26	-.05	.32	—	.46	-.37	-.29	.28
.01	-.12	-.04	-.22	.31	-.15	.48	.46	—	-.37	-.60	.39
.07	.05	.14	.26	-.23	.30	-.31	-.28	-.42	—	.54	-.57
.02	.07	.33	.55	-.07	.36	-.36	-.20	-.37	.40	—	-.64
-.12	-.05	-.15	-.41	.23	-.32	.30	.19	.29	-.34	-.49	—

deviance statistics.⁶ We calculated pseudo R^2 s after each step indicating the within- and between-firms variance explained by the variables in that step, using the calculations recommended by Snijders and Bosker (1994). We tested the multivariate significance of effects in each step by computing the increase in model fit compared with the previous step. The increase in model fit is represented by the decrease in the deviance statistic and follows a chi-square distribution, with the number of additionally estimated parameters as the degrees of freedom.

Results

Means, standard deviations, intraclass correlations, and intercorrelations of all variables on both the individual and firm levels are presented in Table 1. The firm level correlations are the correlations between firm means. The sample comprised 578 women and 757 men (11 respondents did not report gender). The men had significantly more education and tenure compared with the women. There were other significant mean differences between men and women, with men perceiving more job control but less support from their coworkers and leaders. Men and women also differed in their perception of workplace norms, with men rating their firm higher in terms of work pressure or requirements and women rating their firm higher than men in terms of respect-

ful social relations. Men also reported higher means than women for conflicts between work and family. Finally, men in our sample reported slightly higher job stress levels than women. We control for gender at Level 1 in the hierarchical linear models.

The two outcome variables, job stress and health symptoms, were negatively correlated ($-.49$ and $-.64$, at the individual and firm level, respectively) because a high score on the health indicator meant that the respondent was healthy. The individual level correlation between job control and job demands was negative and low ($-.12$), which corresponds with prior studies (i.e., Landsbergis, 1988; Van Yperen & Snijders, 2000). Job control was positively correlated with support from coworkers (.28 at the individual level and .47 at the firm level) and support from leader (.26 at the individual level only). The two

⁶ Raudenbush and Byrk (2001) argued that with unbalanced designs and small Level 2 sample size, restricted maximum likelihood estimation method (RML), which treats the estimates for the regression coefficients as if they carry some uncertainty, leads, in theory at least, to better estimates. Therefore we ran all our models again using RML and found no significant differences in results across estimation methods (results available on request).

support scales correlated .32 at the individual level and .26 at the firm level. Work-to-family conflict correlated, not surprisingly, positively with job demands (.19 at the individual and .49 at the firm level) and negatively with support from coworkers (−.26 at the individual and −.43 at the firm level). Family-to-work conflict was positively correlated with job control at the individual level (.06) and with job demands at both levels (.07 and .45, at the individual and firm level, respectively). Family-to-work conflict also correlated negatively with support from coworkers (−.10 and −.26, at the individual and firm level, respectively). The correlation between two conflict variables was high (.75).

Of the two firm level components of the psychosocial work environment, norms governing social relations were positively correlated with support from coworkers and supervisor (.47 and .46, respectively, both at the firm level) and negatively correlated with work-to-family conflict (−.27, at the firm level). Also at the firm level, work performance norms were positively related to work-to-family conflict (.53), family-to-work conflict (.53), and job demands (.44) and negatively related to support from coworkers and supervisor (−.43 and −.37, respectively). Work performance and social relations survival norms were negatively correlated (−.37).

Table 1 also contains values for ICC(1) and ICC(2), calculated using the mean square between and within values from the one-way analysis of variance where the independent variable is firm identification number.⁷ ICC(1) values represent the percentage of variance attributed to firm level factors in the individual level responses. ICC(2) values represent the reliability of group means. The two indicators of workplace norms—social relations and work performance—had substantial group level variance, ICC(1) = .09% and .10%, respectively, and reliable group means, ICC(2) = .69 and .73, respectively.

The results of the HLM analyses with job stress as the outcome variable are presented in Table 2. The ICC(1) for job stress was 12.7%, which indicates that a sizable amount of variance in individuals' reported level of job stress was due to firm level effects. Of the demographic variables, age was negatively, and tenure and education were positively, related to job stress. The demographic variables explained very little of the variance in the dependent variable, however. The within-firm pseudo R^2 was 3%, and the between-firms pseudo R^2 was 5%.⁸

At the second step we added the variables from the Karasek model, job demands, job control, support from coworkers and supervisor, and three interaction

terms of job demands with and job control, coworker support, and leader support. Job demands were significantly and positively related to job stress. Job control was not related to job stress. Both support variables were negatively related to job stress as expected. The interactions between job demands and job control and job demands and coworker support were significant at the .05 level.

The six variables together with the demographic variables accounted for 25% of the within-firm variance in job stress, an increase of 22%. This is not surprising. What is more interesting is the pseudo R^2 of 46% for the between-firms variance, which means that variables in Step 2 explained almost half of the firm level variance in employees' reports of job stress levels. This result lends support to Van Yperen and Snijders's (2000) report of significant between-groups effects for job control and job demands. The addition of these six variables increased the model fit significantly over and above the demographic variables as indicated by the likelihood ratio test.

Work-to-family conflict and family-to-work conflict were added in Step 3 and both were positively related to job stress, supporting Hypothesis 2a. We had argued that there should be both an individual and a firm level effect of these conflict variables, which is what we found. The explained within-firm variance in individual level reports of job stress increased to 41%, and the explained between-firms variance increased to 76%. The demographic and psychosocial variables taken together also explained somewhat less than half of the within-firm variance and two thirds of the between-firms variance in job stress levels. The model in Step 3 was an improvement in model fit in comparison with the model in Step 2, indicated by the likelihood ratio test.

In the final step we added five variables—organizational size (ln transformed), two indicators of

⁷ The ICC(1) values for job stress and health symptoms were calculated using the variance components of random coefficient models in which there is no predictor and the intercept is random (i.e., null model). The difference between these two different ICC(1) formulas is that in the analysis of variance formula ICC(1) values range between −1 and 1, whereas in the random coefficient model formula values range between 0 and 1.

⁸ A between-pseudo R^2 here means the amount of between-levels variance explained in the individual level variable job stress, which was 12.7% to begin with as indicated by the ICC(1) of this variable. A within-pseudo R^2 means the amount of within-level variance explained in the individual level variable job stress, which was the remaining 87.3% ($100 - 12.7 = 87.3$) to begin with.

Table 2
 Summary of Hierarchical Multilevel Analysis: Outcome Variable Is Job Stress

Step and variable	Job stress			
	B	B	B	B
Step 1				
Gender	1.25 (1.35)	-0.68 (1.31)	-0.65 (0.87)	-0.63 (0.88)
Age	-0.21*** (0.05)	-0.15*** (0.04)	-0.06 (0.03)	-0.03 (0.03)
Years of education	2.58* (1.03)	3.13*** (0.84)	1.79* (0.81)	1.89* (0.83)
Tenure	0.22*** (0.05)	0.16*** (0.04)	0.10** (0.03)	0.05 (0.04)
Pseudo R ² (within)	3%			
Pseudo R ² (between)	5%			
Δχ ² (df)	37.1(4)***			
Step 2				
Job demands (JD)		4.31*** (0.55)	3.30*** (0.32)	3.15*** (0.31)
Job control (JC)		0.68 (0.52)	0.20 (0.44)	0.26 (0.42)
Coworker support (CS)		-7.12*** (0.77)	-4.66*** (0.61)	-4.59*** (0.62)
Leader support (LS)		-1.84*** (0.35)	-1.64*** (0.31)	-1.46*** (0.31)
JC × JD		0.62* (0.25)	0.42 (0.24)	0.53* (0.24)
CS × JD		-1.07* (0.50)	-0.75* (0.36)	-0.76* (0.36)
Pseudo R ² (within)	25%			
Pseudo R ² (between)	46%			
Δχ ² (df)	325.9(6)***			
Step 3				
Work-to-family conflict (W-FC)			6.54*** (0.46)	6.55*** (0.44)
Family-to-work conflict (F-WC)			2.16*** (0.47)	2.18*** (0.47)
Pseudo R ² (within)	41%			
Pseudo R ² (between)	76%			
Δχ ² (df)	308.8(7)***			
Step 4				
Organizational size				0.15 (0.37)
Social relations norms (SR)				-2.32 (1.64)
Work performance norms (WP)				4.42* (1.32)
SR × WP				-5.93* (2.74)
WP × W-FC slope ^a				2.78* (1.27)
Pseudo R ² (within)	41%			
Pseudo R ² (between)	95%			
Δχ ² (df)	31.5(5)***			

Note. Numbers in parentheses are robust standard errors. All independent variables are centered around their grand mean. All Level 1 slopes are fixed except work-to-family conflict and family-to-work conflict. Average Level 2 unit size = 23; harmonic mean = 143.85; number of Level 2 units = 56; number of Level 1 units = 1,190; ICC(1) = 12.7, for job stress. Δχ²(df) = chi-square difference test.

^a To model the interaction effect of work performance norms and work-to-family conflict, we examined the variance explained by work performance norms in the slope parameter of the work-to-family conflict and job stress relationship. * p < .05. ** p < .01. *** p < .001.

workplace norms, their interaction, and work performance norms—as a predictor of the slope of work-to-family conflict. Because norms were assumed to be organizational properties, they entered the model as firm level variables only. As hypothesized, norms that prescribed hard work and constant work attendance were positively related to job stress. Norms encouraging respectful and supportive social relations were not significantly related to job stress, but the interaction between these two norms was significant, however, supporting Hypothesis 1c (see Figure 1a). Finally, in support of Hypothesis 2b, work performance norms moderated the individual level relationship between work-to-family conflict and job stress (see Figure 1b). The between-firms pseudo R^2 increased to 95%, which means that total model accounted for almost all of the between-firms variance in individual job stress levels. In addition, work performance norms explained 56% of the variance in the slope of work-to-family conflict. The addition of Level 2 predictors significantly improved the model fit as indicated by the likelihood ratio test.

The results of the HLM analyses for health symptoms are reported in Table 3.⁹ As reported in Table 1, the intraclass correlation (i.e., the amount of between-firms variance) for health symptoms was 6%, which means that only a small part of the differences in individuals' reports of job-related health problems was attributable to the organization in which they worked. Most of the variance in the health symptoms came from individual level factors.

Among the demographic variables, education was positively related, and tenure negatively related, to health symptoms. The individual level pseudo R^2 was 3%, and the firm level pseudo R^2 was 36%.

The results from adding Karasek's variables in Step 2 show that job demands were negatively, and job control, coworker, and leader support were positively, related to subjective health symptoms. Only the interaction between job demands and coworker support was significant. With these six variables in the model, the amount of within-firm variance explained increased to 18% and the between-firms variance increased to 91%. Because the amount of variance attributed to firm level factors, ICC(1), was so small in the health symptoms variable, however, the pseudo R^2 of 91% means that all variables in Step 2 (the demographic characteristics and the Karasek model variables) together explained almost all of the between-firms variance, but only about 5% of the total variance, in health symptoms.

Work-to-family conflict was significantly and negatively related to health symptoms, but family-to-

work conflict was not, partially supporting Hypothesis 2a. The model at Step 3 explained a total of 29% of Level 1 variance, an 11% increase over Step 2. All of the Level 2 variance was explained by the addition of work-to-family conflict. Because it would be meaningless to add Level 2 effects when there is no significant amount of firm level variance left to explain, we did not analyze Level 2 effects.

Discussion

Our study contributes to the research on the psychosocial work environment by demonstrating that the conceptual definition of the construct should be expanded beyond the individual and task-oriented variables of the Karasek demand-control model to include organizational norms governing work performance and social relations, as well as work-family conflict. We found that norms at the organizational level and conflicts at the work-family boundary were significantly related to employees' reports of job stress. The study also contributes to the literature on job stress by suggesting how norms, as an organizational level property, can affect job stress at the individual level, and finally, to the research on work-family conflict by showing that the relationship between work-to-family conflict and job stress varies across firms as a function of organizational level norms.

We had selected norms for study that were parallels of, but not equivalent to, job demands and social support in the Karasek model. In theory, norms control behavior through people's beliefs that others will apply sanctions if they violate expectations, and when expectations conflict, either with personal preferences or with one another, psychological tension and stress ensue. With respect to the norms governing work performance, we found that they explained a significant amount of variance in job stress over and above the contribution from job demands. Work performance norms include the immediate job requirements, as demonstrated by the positive correlations between the two variables, but they also contain expectations about a much wider domain of behavior.

⁹ The subjective health measure contained items about both somatic and psychological complaints. We computed separate equations for physical and psychological health. There were no differences in the relationships between the main variables and the health indicators, but there were differences in the relationships with demographic variables. To conserve space, we do not report these results in the tables, but they are available on request.

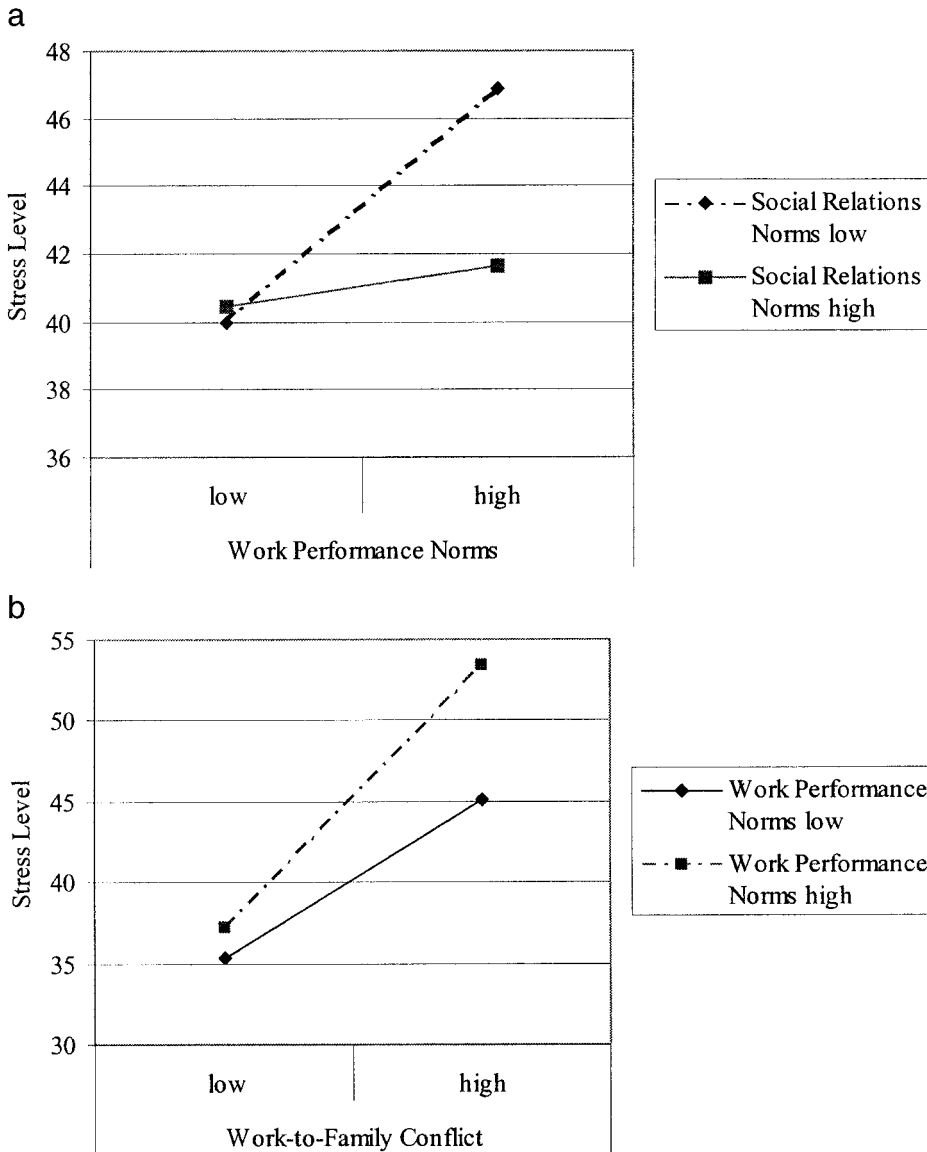


Figure 1. (a) Social relations norms as a moderator of the relationship between work performance norms and job stress. (b) Work performance norms as a moderator of the relationship between work-to-family conflict and job stress.

Contrary to our expectations, we did not find a main effect of social relations norms on job stress. We argued that norms that prescribe respectful, helpful, and cooperative behavior throughout the organization would encompass interaction patterns and relationships beyond those experienced in the immediate work group. However, our results suggest

that organizational level social relations norms find their full expression in the supportive behaviors employees experience at the point of production. An alternative explanation is that our measure of social relations norms was not broad enough to cover the full domain of this variable. On the other hand, the significant interaction between the work performance

Table 3
Summary of Hierarchical Multilevel Analysis: Outcome Variable Is Health Symptoms

Step and variable	Health symptoms		
	<i>B</i>	<i>B</i>	<i>B</i>
Step 1			
Gender	-0.01 (0.02)	0.01 (0.02)	0.00 (0.03)
Age	0.00 (0.00)	0.00 (0.00)	-0.002* (0.001)
Years of education	0.09*** (0.02)	0.06*** (0.02)	0.08*** (0.01)
Tenure	-0.005** (0.00)	-0.003** (0.001)	-0.002* (0.001)
Pseudo <i>R</i> ² (within)	3%		
Pseudo <i>R</i> ² (between)	36%		
$\Delta\chi^2(df)$	41.5(4)***		
Step 2			
Job demands (JD)		-0.08*** (0.01)	-0.07*** (0.01)
Job control (JC)		0.04*** (0.01)	0.04*** (0.01)
Coworker support (CS)		0.10*** (0.02)	0.06** (0.02)
Leader support (LS)		0.02* (0.01)	0.02 (0.01)
JC × JD		0.00 (0.01)	0.01 (0.00)
CS × JD		0.03** (0.01)	0.03*** (0.01)
Pseudo <i>R</i> ² (within)		18%	
Pseudo <i>R</i> ² (between)		97%	
$\Delta\chi^2(df)$		229.8(6)***	
Step 3			
Work-to-family conflict			-0.13*** (0.01)
Family-to-work conflict			-0.01 (0.01)
Pseudo <i>R</i> ² (within)			29%
Pseudo <i>R</i> ² (between)			100%
$\Delta\chi^2(df)$			174.3(2)***

Note. Numbers in parentheses are robust standard errors. All independent variables are centered around their grand mean. All Level 1 slopes are fixed. Average Level 2 unit size = 23; harmonic mean = 143.85; number of Level 2 units = 56; number of Level 1 units = 1,190; ICC(1) = 6.2, for health symptoms. $\Delta\chi^2(df)$ = chi-square difference test.

* *p* < .05. ** *p* < .01. *** *p* < .001.

and social relations norms suggests that the latter may make work performance pressures more tolerable in general by creating what Cooke and Rousseau (1988) called a “constructive” organizational culture, aside from any effect they have on supportive behavior.

That organizational level norms, especially those controlling work performance, had an impact on job stress over and above the immediate demands and social support employees experienced in their jobs

supports our argument that the psychosocial work environment should be viewed as an organizational property or characteristic. Employees will, of course, feel the effects of their immediate work situation, as this study and many previous studies have demonstrated, but the unwritten rules, routines, norms, and institutions that exist at levels above the direct interactions an employee has with his or her job, coworkers, and supervisor, are also part of the psychosocial work environment.

Norms were not related to subjective health, however. Health may be less susceptible than job stress to general expectations about behavior, as opposed to specific or more sharply defined sources of psychological tension and tension relief. It is also possible that job stress mediates the relationship between norms and health, which would mean that health is too far removed from norms in a causal chain.

Both work-to-family and family-to-work conflict contributed significantly to the explanation of individual and organizational level variance in job stress. The pseudo R^2 increased by 16% at the individual level when these types of conflict were added to the equation, which means that the differences between each employee's experience of conflict at the work-family boundary are related to differences in job stress levels, as we expected would be the case.

The increase in the pseudo R^2 of 30% at the organizational level is more interesting. The fact that the individual level variables of work-family conflict explained considerable between-firms variance in employee job stress suggests that this relationship may be stronger in some firms and weaker in others. For example, in firms with family-friendly policies and practices, employees' experiences of conflict at the work-family boundary may not be related to job stress. On the other hand, in firms with strong work performance norms, conflict at the work-family interface is more likely to lead to job stress. As hypothesized, the relationship between work-to-family conflict and job stress was moderated by work performance norms. When organizational norms contain expectations about high productivity, constant job attendance, commitment to serve the organization's needs, and a message that only the strongest ones survive, work-to-family conflict is more strongly related to job stress.

We are basing our interpretation of these results on the assumption that work-to-family conflict can contribute to job stress. A counter argument is that job stress may be a cause, not an outcome, of work-to-family conflict (Frone, 2003; Frone et al., 1997). If one follows the latter argument, one could interpret our interaction result to mean that work performance norms and job stress combine to cause increased levels of work-to-family conflict.¹⁰ When we tested this alternative hypothesis, however, we found that the interaction of work performance norms and job stress on work-to-family conflict was not significant. In fact, the relationship between job stress and work-to-family conflict did not vary across firms in our sample.

The variables in this study (except firm size) were

measured using the same method (i.e., self-reports) and the same source (i.e., employees). The data are cross-sectional. It can be argued that monomethod and common-source biases may account for parts of the relationships we found. This is a reasonable argument, but we believe these biases cannot be the only reason behind the significant coefficients we present, and we argue that the relative intensity of relationships would still hold although the absolute strength of relationships may have an upward bias.

Our findings are to some extent influenced by the industry from which we drew our sample. The food and beverage industry is one of most traditional industries left in Norway with respect to production systems and the ways work is organized at the point of production. Compared with manufacturing firms in other Western countries, the level of automation is low, and the firms are relative small. The possibilities for employee autonomy and influence over work seem to be limited and the job demands are high, a combination that should create high-strain jobs (Karasek & Theorell, 1990). This could mean that the relationships between the Karasek model variables and job stress and subjective health indicators were stronger than what we would find in less traditional industrial work settings. Because we wanted to show that firm level components of the psychosocial work environment would capture significant variance in employee well-being controlling for the Karasek model, however, the sample provides for a conservative test of our hypotheses.

Our results show that organizational level behavioral and social norms are significant additions to the psychosocial work environment commonly defined by the job demands, control, and social support experienced at the individual level. No doubt there are additional components of the psychosocial work environment of importance to employee well-being. Our study is the beginning of an effort to define and measure explicitly those organizational characteristics that have been implicitly acknowledged to operate in the theoretical literature but have been neglected in the empirical literature. We conclude that individuals' perceptions of their work experiences are important, but what we consider the core of the concept "psychosocial," the internal social relations in the firm, and external social relations (e.g., family), deserve more attention.

¹⁰ This interpretation was suggested by an anonymous reviewer.

References

- Barling, J. (1992). *Employment, stress and family functioning*. Chichester, England: Wiley.
- Bliese, P. D., & Jex, S. M. (2002). Incorporating a multi-level perspective into occupational stress research: Theoretical, methodological, and practical implications. *Journal of Occupational and Health Psychology, 7*, 265–276.
- Caplan, R. D. (1987). Person–environment fit theory and organizations: Commensurate dimensions, time perspectives, and mechanism. *Journal of Vocational Behavior, 31*, 248–267.
- Cooke, R. A., & Rousseau, D. M. (1988). Behavioral norms and expectations: A quantitative approach to the assessment of organizational culture. *Group and Organization Studies, 13*, 245–273.
- Cooper, C. L. (1981). *The stress check*. New York: Prentice Hall.
- 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.
- de Jonge, J., van Breukelen, G. J. P., Landeweerd, J. A., & Nijhuis, F. J. N. (1999). Comparing group and individual level assessments of job characteristics in testing the job demand–control model: A multilevel approach. *Human Relations, 52*, 95–122.
- de Rijk, A. E., le Blanc, P. M., Schaufeli, W. B., & de Jonge, J. (1998). Active coping and need for control as moderators of the job demand–control model: Effects on burnout. *Journal of Occupational and Organizational Psychology, 71*, 1–18.
- Dyer, W. G. (1986). *Cultural change in small firms*. San Francisco: Jossey-Bass.
- Edwards, J. R. (1991). Person–job fit: A conceptual integration, literature review, and methodological critique. In C. L. Cooper & I. T. Robertson (Eds.), *International review of industrial and organizational psychology* (Vol. 6, pp. 283–358). New York: Wiley.
- Edwards, J. R. (1996). An examination of competing versions of the person–environment fit approach to stress. *Academy of Management Journal, 39*, 292–339.
- European Foundation. (1997). *Working conditions in the European Union: Second European survey on working conditions*. Dublin, Ireland: EURF.
- Frone, M. R., (2003). Work–family balance. In J. Quick & L. E. Tetrick (Eds.), *Handbook of occupational health psychology* (pp. 143–162). Washington, DC: American Psychological Association.
- Frone, M. R., Yardley, J. K., & Markel, K. (1997). Developing and testing an integrative model of the work–family interface [Special issue: On work–family balance]. *Journal of Vocational Behavior, 50*, 145–167.
- Gardell, B. (1977). Autonomy and participation at work. *Human Relations, 30*, 515–533.
- Greenhaus, J. B., & Beutell, N. J. (1985). Sources of conflict between work and family roles. *Academy of Management Review, 10*, 76–89.
- Homans, G. C. (1992). *The human group*. New Brunswick, NJ: Transaction.
- Ironson, G. (1992). Work, job stress, and health. In S. Zedeck (Ed.), *Work, families, and organizations: Frontiers of industrial and organizational psychology* (Vol. 5, pp. 1–32). San Francisco: Jossey-Bass.
- Ivanevich, J. M., & Matteson, M. T. (1980). *Stress and work: A managerial perspective*. Glenview, IL: Scott Foresman.
- Johnson, J. V., & Hall, E. M. (1996). Dialectic between conceptual and causal inquiry in psychosocial work environment research. *Journal of Occupational Health Psychology, 1*, 362–374.
- Johnson, J. V., & Johansson, G. (1991). *The psychosocial work environment: Work organization, democratization and health*. Amityville, NY: Baywood.
- Kahn, R. L., & Byosiore, P. (1992). Stress in organizations. In M. D. Dunnette & L. M. Hough (Eds.), *Handbook of industrial and organizational psychology* (2nd ed., Vol. 3, pp. 571–651). Palo Alto, CA: Consulting Psychologists Press.
- Karasek, R. A. (1979). Job demands, job decision latitude, and mental strain: Implications for job design. *Administrative Science Quarterly, 24*, 285–307.
- Karasek, R. A., Brisson, C., Kawakami, N., Houtman, I., Bongers, P., & Amick, B. C. (1998). The Job Content Questionnaire (JCQ): An instrument for internationally comparative assessments of psychosocial job characteristics. *Journal of Occupational Health Psychology, 3*, 322–355.
- Karasek, R., & Theorell, T. (1990). *Healthy work: Stress, productivity and the reconstruction of working life*. New York: Basic Books.
- Kasl, S. V. (1996). The influence of the work environment on cardiovascular health: A historical, conceptual, and methodological perspective. *Journal of Occupational Health Psychology, 1*, 42–56.
- Kasl, S. V. (1998). Measuring job stressors and studying the health impact of the work environment: An epidemiological commentary. *Journal of Occupational Health Psychology, 3*, 390–401.
- Katz, D., & Kahn, R. L. (1978). *The social psychology of organizations* (2nd ed.). New York: Wiley.
- Kelloway, E. K., Gottlieb, B. H., & Barham, L. (1999). The source, nature, and direction of work and family conflict: A longitudinal investigation. *Journal of Occupational Health Psychology, 4*, 337–346.
- Klein, K. J., Dansereau, F., & Hall, R. J. (1994). Levels issues in theory development, data collection, and analysis. *Academy of Management Review, 19*, 195–229.
- Koslowsky, M. (1998). *Modeling the stress–strain relationship in work settings*. London: Routledge.
- Kozlowski, S. W. J., & Klein, K. J. (2000). A multilevel approach to theory and research in organizations: Contextual, temporal, and emergent processes. In K. J. Klein & S. W. J. Kozlowski (Eds.), *Society for Industrial and Organizational Psychology Frontiers Series: Multilevel theory, research, and methods in organizations* (pp. 3–90). San Francisco: Jossey-Bass.
- Kristensen, T. S. (1995). The demand–control–support model: Methodological challenges for future research. *Stress Medicine, 11*, 17–26.
- Kristensen, T. S. (1996). Job stress and cardiovascular disease: A theoretic critical review. *Journal of Occupational Health Psychology, 1*, 246–260.
- Landsbergis, P. A. (1988). Occupational stress faced by health care workers: A test of the job demands–control model. *Journal of Organizational Behavior, 9*, 217–239.
- Landsbergis, P. A., Mikkelsen, A., Saksvik, P. Ø., de Jonge, J., Houtman, I., Cedillo, L., et al. (2000, November).

- Reliability and validity of the Job Content Questionnaire (JCQ) decision latitude scale.* Paper presented at the International Congress of Behavioral Medicine, Brisbane, Australia.
- Marmot, M. G., Davey Smith, G., Stansfeld, D., Patel, C., North, F., Head, J., et al. (1991). Health inequalities among British civil servants: The Whitehall II study. *Lancet*, *337*, 1387–1392.
- Raudenbush, S. W., & Byrk, A. S. (2001). *Hierarchical linear models: Applications and data analysis methods* (2nd ed.). Thousand Oaks, CA: Sage.
- Schein, E. H. (1992). *Organizational culture and leadership* (2nd ed.). San Francisco: Jossey-Bass.
- Shrout, P. E., & Fleiss, J. L. (1979). Intraclass correlations: Uses in assessing rater reliability. *Psychological Bulletin*, *86*, 420–428.
- Siegrist, J. (1996). Adverse health effects of high-effort/low reward conditions. *Journal of Occupational Health Psychology*, *1*, 27–41.
- Snijders, T. A. B., & Bosker, R. J. (1994). Modeled variance in two-level models. *Sociological Methods and Research*, *22*, 342–363.
- Söderfeldt, B., Söderfeldt, M., Jones, K., Ocampo, P., Mountaner, C., Ohlson, C. G., & Warg, L. E. (1997). Does organization matter? A multilevel analysis of the demand–control model applied to human services. *Social Science and Medicine*, *44*, 527–534.
- Theorell, T., & Karasek, R. A. (1996). Current issues relating to psychosocial job strain and cardiovascular disease research. *Journal of Occupational Health Psychology*, *1*, 9–26.
- Theorell, T., Michélsen, H., Nordemar, R., & Stockholm Music 1 Study Group. (1991). Tre arbetsmiljöindex som använts i Stockholmsundersökningen 1 [Three work environment scales used in the Stockholm Study 1]. In M. Hagberg & C. Hogstedt, *Stockholmsundersökningen 1* [Stockholm Study 1] (pp. 150–168). Stockholm: Music Books.
- Van der Doef, M., & Maes, S. (1999). The job demand–control(–support) model and psychological well-being: A review of 20 years of empirical research. *Work & Stress*, *13*, 87–114.
- Van Yperen, N. W., & Snijders, T. A. B. (2000). A multi-level 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.
- Voydanoff, P. (2002). Linkages between the work–family interface and work, family, and individual outcomes. *Journal of Family Issues*, *23*, 138–164.

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