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Stressors and Adverse Outcomes for Female Construction Workers

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The authors examined the impact of a number of job stressors, including sexual harassment and gender-based discrimination, on female construction workers' level of job satisfaction and psychological and physical health. Results from a telephone survey with 211 female laborers indicated that having responsibility for others' safety and having support from supervisors and male coworkers was related to greater job satisfaction. Increased reported psychological symptoms were also related to increased responsibility, as well as skill underutilization, experiencing sexual harassment and gender-based discrimination from supervisors and coworkers, and having to overcompensate at work. Perceptions of overcompensation at work and job uncertainty were positively associated with self-reports of insomnia. Finally, sexual harassment and gender discrimination were positively related to reports of increased nausea and headaches.

Even though work-related injury rates in the construction industry have been declining, they are still 50% higher than the average for all private industry (Center to Protect Workers' Rights, 1997). Given the risks associated with working in construction, it is somewhat surprising that in comparison with other occupations, there is less published research looking at the health and safety of construction workers, particularly in the area of job stress and related health and safety outcomes. More to the point for the research reported in this article, the literature published has not looked at job stress and adverse outcomes for female construction workers. This, however, is not surprising given the relatively small amount of overall research attention paid to, and insufficient data on, job stress among women working in nontraditional occupations (Keita & Hurrell, 1994).

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In 1995, the construction industry employed approximately 140,000 tradeswomen, representing about 2% of construction workers (U.S. Department of Labor, Bureau of Labor Statistics, 1995). When asked, women in construction reported choosing their careers because of higher wages, a wider variety of work schedules, and greater personal satisfaction than have characteristically been found in traditionally female-dominated occupations (Marshall, 1990; O'Farrell & Harlan, 1982). For these and perhaps other reasons, it is expected that more women consider construction work as a career option. Although male and female construction workers are likely affected without regard to gender by job stressors typically associated with construction work (e.g., physical and chemical exposures), some job stressors might have a disproportionate impact on female construction workers (e.g., lack of skills training and skill underutilization). Also, in comparison with male workers, female construction workers might be exposed to additional job stressors (e.g., gender-specific stressors) associated with working in the dominant "male construction-culture" (Goldenhar & Sweeney, 1996; Marshall, 1990; Nelson & Hitt, 1992; Occupational Safety and Health Administration, 1997; Reimer, 1979; Walshok, 1981; Weaver, Gunto, Berger, & Dwyer, 1996).

Although studies examining the "classic" job stressors (e.g., job demands, job control, job uncertainty) among women working in predominantly female occupations (e.g., clerical workers, nurses, sewing machine operators) are now more common than they were in the 1970s, they are still few in number (see Swanson, Piotrkowski, Keita, & Becker, 1997, for a review). Authors have suggested that

women not only face the same job stressors as men (e.g., job uncertainty, high demands, and low control), but they also must deal with additional stressors such as balancing the multiple role demands of work and home (Reich & Nussbaum, 1994) and encountering gender-related stressors (e.g., sexual harassment, discrimination, and limited job opportunities) often associated with entering male-dominated occupations (Gruber & Bjorn, 1982; Johnson, 1991; Nelson & Hitt, 1992), such as construction. It has been recommended that stressors such as these be included in models designed to predict or explain stress-related outcomes (e.g., depression, anger, somatization) for women (Goodman, Koss, & Russo, 1993; Landrine, Klonoff, Gibbs, Manning, & Lund, 1995; Russo, 1995). This study was designed to look at these issues among a sample of female construction workers.

Conceptual Model

The conceptual model used to guide our study is based on a job stress model described by Hurrell & Murphy (1992; see Figure 1). It has been adapted for this study to take into consideration construction-specific as well as gender-specific stressors (discussed later). As can be seen in Figure 1, job stressors in this modified model fall into three broad categories: job or task demands (i.e., job demands, control, responsibilities) organizational factors (e.g., job certainty, harassment, training, safety climate) and physical–chemical exposures (e.g., noise, dust; Hurrell & Colligan, 1982). In addition, social support is modeled as both a main effect and an interaction term. The lack of social support from coworkers, and particularly supervisors, has been shown to be a source of stress for the tradeswoman and women working in other nontraditional occupations (Arnick & Celentano, 1991; Kissman, 1990; McIlwee, 1982). We hypothesized that in addition to the main effect of supervisor and coworker support on female construction workers' level of job satisfaction and psychological and physical health, this support variable might also moderate the effect of control or sexual harassment and discrimination on the outcomes of interest. Coworkers, and primarily the supervisor on construction sites, create a work environment in which the crew works. Thus, the environment changes from supervisor to supervisor and from work crew to work crew. Therefore, we hypothesized that supportive supervisors and male coworkers would help moderate the potential negative consequences associated with a lower sense of control that a female worker might

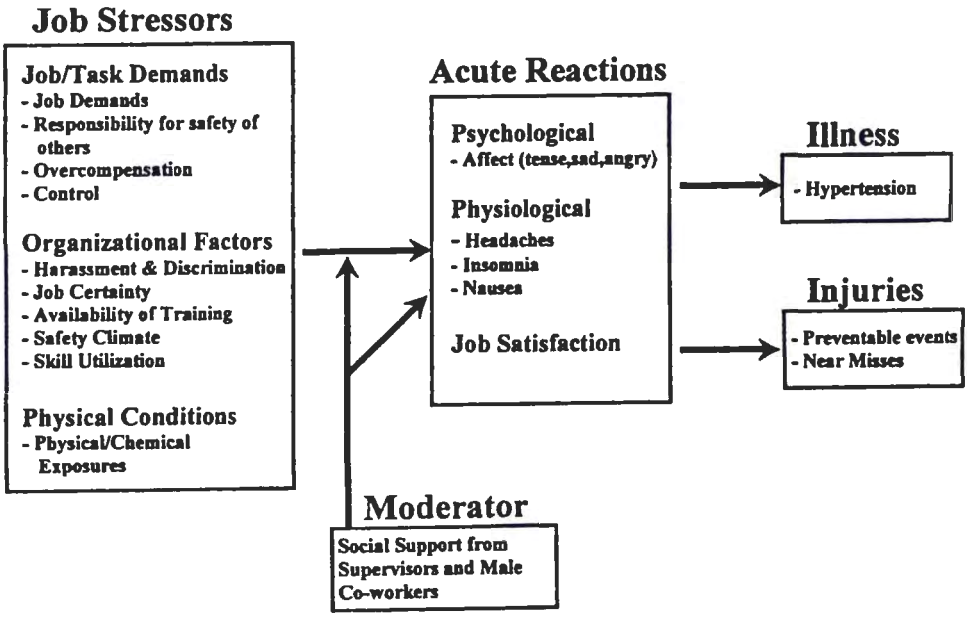

Figure 1. Job stress model for female construction workers. From "Psychological Job Stress," by J. J. Hurrell, Jr., and L. R. Murphy (p. 677), in W. N. Rom (Ed.), *Environmental and Occupational Health* (2nd ed.), 1992, Boston: Little, Brown. Copyright 1992 by Lippincott-Raven. Adapted with permission.

have as well as the negative outcomes of being harassed or discriminated against. We now briefly discuss the construction-specific and gender-specific stressors.

Construction-Related and Gender-Specific Stressors Added to the Model

Safety climate, measured as workers' perceptions about managements' commitment to providing a safe work environment for their employees, has been shown to be an important indicator of worker health and safety behavior in the occupational area of health care (DeJoy, Murphy, & Gershon, 1995), as well as in construction (Dedobbeleer & German, 1987; Mattila, Hyttinen, & Rantanen, 1994). Thus, a safety climate measure was included in this study to see if the lack of a strong safety climate was an important job stressor for female construction workers.

Having increased responsibility for the welfare of others at work has been previously examined for its relationship to job satisfaction (Studenski & Barczyk, 1987) as well as to adverse health outcomes (Murphy, 1991). Thus, we included a "responsibility for the safety of others" variable in the model because of previous research and because it was identified by tradeswomen as being integral to working on a construction site as well as being a source of stress (Goldenhar & Sweeney, 1996).

It is important that construction workers not only receive proper skills training, but also that they be given the opportunity to use and practice those skills to gain proficiency and mastery. Tradeswomen reported that often they were not given the same opportunities as were their male counterparts to learn and use necessary skills (Goldenhar & Sweeney, 1996; LeBreton & Loevy, 1992). Skill underuse has been shown to be an important issue for women working in nontraditional occupations (Tallichet, 1995).

Female construction workers report that they often have to overcompensate in their work to prove themselves to their male coworkers and supervisors (Goldenhar & Sweeney, 1996). The construct of "overcompensating at work" has been identified as an important issue in studies of women working in other nontraditional fields (Johnson, 1991) and thus was included as a job stressor in this study.

Finally, sexual harassment and gender-based discrimination were included in the model as job stressors because these issues have been identified as major concerns of women working in the construction industry (LeBreton & Loevy, 1992; Marshall, 1990) as well as in other nontraditional occupations including engineering and science (Lafontaine & Tredeau, 1986), firefighting (Rosell, Miller, & Barber, 1995; Yoder & Aniakudo, 1995), police work (Brown, Campbell, & Fife-Schaw, 1995), and the navy (Newell, Rosenfeld, & Culbertson, 1995). In this study, sexual harassment refers to unsolicited and unwanted verbal or physical sexual behaviors or overtures at the workplace (Schroedel, 1990), while gender-based discrimination refers to nonsexual demeaning and discriminatory behaviors targeted at a particular gender (in this case, women). Such behaviors may range from sexist put-downs to unfair treatment by employers or coworkers to denial of promotions (Klonoff & Landrine, 1995; Landrine et al., 1995). Both sexual harassment and gender-based discrimination should be considered potentially serious job stressors (Fitzgerald, Hulin, & Drasgow, 1994; Klonoff & Landrine, 1995; Schneider, Swan, & Fitzgerald, 1997). Recipients of sexual harassment and gender-based discriminatory behaviors have reported a range of psychological and physical symptoms, including anxiety, depression, fearfulness, insomnia, headaches, nausea, and gastrointestinal disorders (Fitzgerald, 1993; Gutek & Koss, 1993; Hamilton, Alagna, King, & Lloyd, 1987; Kasinsky, 1992; Landrine et al., 1995; Schneider et al., 1997). Additionally, sexual harassment and gender-based discrimination have been shown to negatively affect job satisfaction and attitudes about the job (Gruber & Bjorn, 1982; Kauppinen-Toropainen & Gruber, 1993; Morrow, McElroy, & Phillips, 1994; Ragins & Scandura, 1995; Schneider et al., 1997; Thacker & Gohmann, 1996), and may affect job performance through distraction, reduced productivity, and absenteeism (Thacker & Gohmann, 1996).

Method

Design

We used a single sample, cross-sectional survey design, with partial random selection. Therefore, the study is exploratory and the findings are descriptive in nature. As such, we will discuss only associations and make no causal assumptions between constructs.

Sample

Female laborers were chosen as the study population for two reasons. First, in the building trades, there is a higher percentage of women employed as laborers than as carpenters, electricians, or plumbers (4% vs. 2%; Center to Protect Workers' Rights, 1997). Second, representatives at the Laborers' Health and Safety Fund as well as local union

officials of the Laborers' International Union of North America (LIUNA) in Seattle, Washington, and Portland, Oregon, were willing to assist with this project. Laborers work directly with other skilled tradespeople, helping them perform their tasks more efficiently.

Because of privacy concerns, the business agents at the three Seattle local unions were reluctant to reveal the names, addresses, and phone numbers of their membership from which we would have been able to randomly select potential respondents. Alternatively, they printed out mailing labels that were used to send letters (using LIUNA letterhead and signed by the appropriate business agent) describing the study to all 365 female members. The letter stated that LIUNA and the National Institute for Occupational Safety and Health (NIOSH) were conducting a study to look at job-related stress and health and safety outcomes among female and male construction workers. The letter stated that participants would be asked about their current job stressors, beliefs about job security, health issues, and so on. It explained that participation was completely voluntary and that there would be no way to link specific responses to individual respondents because no identifying information would be kept once the interview was completed. The letter requested that members return the prepaid postcard (sent with the letter) if they wanted to participate. After we received only 67 postcards over a 2-week period (18% response rate), the Seattle business agents agreed to provide us with the names and phone numbers for all 365 female members. Thus, we obtained the Seattle sample by calling the 67 members who had returned their cards plus the remaining 298 female laborers who had not returned their cards. To help ensure an acceptable sample size, we randomly selected an additional 40 names (out of 117 female members) from the membership roster of a nearby Laborers' local in Portland, Oregon. The same letter explaining the study (described previously) was sent out to the Portland members and the same protocol for requesting participation was followed.

Questionnaire Development

Tables 1, 2, and 3 contain the items used to measure the independent, dependent, and moderator variables as well as their means, standard deviations, and ranges. Given the time restriction for data collection (a one-half hour phone interview), the number of items used to operationalize each construct had to be limited. In many cases, the wording of the questions was adapted to address the unique nature of the construction worksite (e.g., specifying the contractor's responsibility for providing personal protective equipment and worker responsibility for the "safety" (vs. welfare) of others on the jobsite. Next, we describe in greater detail the sources for the individual items.

NIOSH Job Stress Questionnaire. The NIOSH Job Stress Questionnaire (Hurrell & McLaney, 1988) was the primary source for questions measuring job control, job demands, job certainty, job satisfaction, responsibility, skill underuse, and social support. Items were chosen on the basis of previously demonstrated reliability and validity. The reliability of the scales demonstrated in the current study by alpha coefficients were similar in nature to the original reliabilities, thus maintaining their psychometric properties. (See Table 4: Cronbach's alpha coefficients are on the diagonal of the correlation matrix; Cronbach, 1951).

In the control scale, the added question of "having the ability to take a bathroom break" was an issue that came up repeatedly in focus groups and interviews with tradeswomen and thus was deemed an important aspect of control for this population. The two items "having responsibility for the safety of others" and "skill underutilization" did not load as expected. Nevertheless, given that tradeswomen identified these issues as sources of stress, they were included as single-item constructs.

The item "all in all how satisfied are you with your job" is a measure of general (facet-free) satisfaction; that is, job satisfaction conceived in terms of a worker's general affective reaction to the job without reference to any specific job facets. Although its precise origins are lost to antiquity, it has been used repeatedly by job stress investigators and was used in the 1969, 1972–1973, and 1977 Quality of Employment Surveys (Quinn & Staines, 1979). Factor analytic assessments of facet-free job satisfaction scales containing this item (see Quinn & Cobb, 1971) have shown it to account for a substantial proportion of the variance in the scales, while other studies (e.g., Caplan, Cobb, French, Harrison, & Pinneau, 1975; Wanous, Reichers, & Hudy, 1997) have shown it to correlate highly with other aspects of satisfaction. In this study it was dichotomized using a median split (the median was equal to 4.5).

NIOSH Management Commitment Scale. The four items from the NIOSH Management Commitment to Safety Scale (DeJoy et al., 1995) were adapted for use in the present study. Additionally, an item measuring management expectations for training new employees was included in the scale. The reliability coefficient (Cronbach alpha = .86) was somewhat higher than that obtained with the original scale (.83).

The Northwestern National Life Insurance Company (NNLIC) Survey on Workplace Violence. The questions measuring physical health outcomes as well as sexual harassment and discrimination were developed using questions from the NNLIC survey on workplace violence as a starting point (NNLIC, 1993). The NNLIC survey queries respondents about a wide range of perpetrators of workplace harassment and discriminatory behaviors. We chose to restrict our questions to supervisors and male coworkers, as they were cited by tradeswomen as the most likely perpetrators. There were no reliability statistics provided from the NNLIC; however, we obtained an acceptable Cronbach's alpha of .75 with our scale.

We attempted to combine the physical outcomes into a single scale but they did not aggregate as desired (Cronbach alpha = .56). Therefore, each physical symptom (nausea, headaches, insomnia) was treated as a single-item outcome, as they were in the Northwestern study. Given the skewed distribution of the responses, we dichotomized the physical symptom outcomes using a median split into a case versus noncase distinction. Thus, a response of 1 or 2 = 0 (noncase) and a response of 3, 4, or 5 = 1 (case).

Profile of Mood States (POMS). Items from the POMS (McNair, Lorr, & Droppleman, 1981) questionnaire were used to measure psychological symptoms. Three items with the highest average factor loadings (respectively) on the POMS Tension–Anxiety, Depression–Dejection, and Anger–Hostility scales across six separate studies were selected. These items, anger, tension, and sadness, were selected because they were commonly reported as psychological outcomes in prior studies of sexual harassment and discrimination (e.g., Fitzgerald, 1993). Similar POMS items

Table 1
Independent Variables—Job Stressors

Variable and items	*M*	*SD*	Range
Control—(5-point scale: *Very little* to *a great deal*)	17.87	5.04	4–25
1. How much control (do/did) you have over the types of tasks you (are/were) assigned to do during a work-day?			
2. How much control (do/did) you have over getting the contractor to provide you with the proper Personal Protective Equipment that you (need/needed)?			
3. How much control (do/did) you have over how fast or slow you (work/worked)?			
4. How much control (do/did) you have over when you (can/could) take a bathroom break?			
5. In general, how much control would you say you (have/had) over your work and work-related factors?			
Job demands—(5-point scale: *Never* to *always*)	7.19	1.91	2–10
1. How often (do/did) you have to work very fast on the job?			
2. How often (do/did) you have to work very hard on the job?			
Safety climate—(4-point scale: *Strongly disagree* to *strongly agree*)	16.29	3.20	5–20
1. At this jobsite, employees, supervisors, and managers (work/worked) together to ensure the safest possible working conditions			
2. At this jobsite, significant shortcuts (are/were) taken which could put a worker's health and safety at risk. (Recoded)			
3. The protection of workers (is/was) a high priority with supervisors at this jobsite.			
4. At this jobsite unsafe work practices (are/were) corrected by supervisors.			
5. When you were a new employee at this jobsite, you learned that you were expected to follow good safety practices.			
Responsibility for safety of others—(4-point scale: *Very little—A lot*)	3.60	.086	1–4
1. At work, how much responsibility do you have for the safety of others on the jobsite?			
Training—(4-point scale: *Strongly disagree* to *strongly agree*)	9.26	1.62	4–12
1. At this jobsite, sometimes I (am/was) given a task to do and I (am/was) not sure how to do it. (Recoded)			
2. I believe that I have been properly trained to use all types of Personal Protective Equipment.			
3. Overall, I believe that I have had the training I need to work safely.			
4. Overall, I wish that I had been better trained before ever working on a construction site. (Recoded)			
Daily exposure—(Summated scale)	16.64	9.72	0–49
How many hours per day are you exposed to each of the following hazardous or unpleasant conditions: noise, chemicals, asphalt, asbestos, and lead?			
Job certainty—(4-point scale: *Very uncertain* to *certain*)	10.16	3.33	4–16
1. How certain are you that job promotion and job advancement will exist for you in the construction industry during the next few years?			
2. If you lost your job, how certain are you that you could support yourself?			
3. If you lost your job, how certain are you that you could find a job to replace your income?			
4. How certain are you about your job future?			
Sexual harassment and discrimination—(2-point scale: *No–Yes*)	1.31	1.66	0–6
1. On the jobsite, have you ever had unwanted suggestions about, or references to, sexual activity directed at you by (a) co-workers or (b) supervisors?			
2. On the jobsite, have you ever experienced unwanted physical contact, including that of a sexual nature, by (a) co-workers or (b) supervisors?			
3. On the jobsite, have you ever felt that you were mistreated due to the fact that you were a female by (a) co-workers or (b) supervisors?			
Overcompensating at work—(5-point scale: *Never* to *always*)	2.66	1.52	1–5
1. How often on this job (do/did) you feel that you (have/had) to work harder than others in order to "prove" yourself?			
Skill underutilization—(5-point scale: *Never* to *always*—Recoded)	2.61	1.27	1–5
1. At work, how often (are/were) you given a chance to do the things that would help you improve or perfect your skills?			

Table 2
Dependent Variables—Adverse Outcomes

Variable and items	*M*	*SD*	Range
Job satisfaction—(5-point scale: *Strongly dissatisfied* to *strongly satisfied*; median split at 4.5)	Dichotomized *N*		
1. Overall, how satisfied would you say you (are/were) with your job?	0 = 106	1 = 105	
Psychological symptoms—(5-point scale: *Never* to *always*)	7.09	2.02	3–12
1. In the past year, how often have you felt tense?			
2. In the past year, how often have you felt angry?			
3. In the past year, how often have you felt sad?			
Physiological symptoms—(5-point scale: *Never* to *always*)	Dichotomized *N*		
1. In the past year, how often have you experienced insomnia or had trouble sleeping?	0 = 145	1 = 6	
2. In the past year, how often have you felt symptoms of nausea or stomach disorders?	0 = 162	1 = 49	
3. In the past year, how often have you experienced headaches?	0 = 129	1 = 82	

have been used in several prior NIOSH job stress studies and have been found to produce adequate reliabilities when combined into factors. For example, a recent study of 230 data entry operators who were asked about feelings of tension, anger, and sadness over the past month yielded a Cronbach's alpha for these items of .73 (Swanson, 1997, unpublished data). This corresponds closely to the Cronbach's alpha of .67 achieved for these items in the present study.

Daily Exposure, Training, and Overcompensating at Work. Tradeswomen state that one of their greatest sources of stress is daily exposure to hazardous chemicals or other physical agents (Goldenhar & Sweeney, 1996). To obtain in-depth information regarding the sources of exposures for laborers, officials at LIUNA were asked to provide lists of task-based exposures, and questions were developed to address these identified exposures. The exposure variable is a summation of total hours per day for all reported exposures. Thus, the total number of hours could equal more than one full work day.

The amount and type of training received and the issue of having to constantly prove themselves (overcompensation at work) were identified as sources of stress for tradeswomen (Goldenhar & Sweeney, 1996) and were therefore included in the model.

Data Collection

The questionnaire was pretested with 20 male and 19 female construction workers. A few minor wording changes were made on the basis of the results of the pretest. Interviewers were trained, and the one-half hour telephone interviews using the revised survey were conducted between May and August 1996. Once contacted (mean number of contacts was 4), respondents were reminded of the letter and the postcard they had been sent and reminded of the purpose and sponsors of the study. They were then asked if they wished to participate in the one-half hour survey (average interviewing time 27 min) either at that time or during a future scheduled time.

The interviewers used a Computer-Assisted Telephone Interviewing (CATI) system, whereby answers to questions were entered directly into a computer database as the interview was being conducted. Upon interview completion, the postcard with the respondent's name and number was destroyed. No unique respondent identifiers were included in the database. The eligibility requirement for participation was that the respondent be a female laborer and had to have worked on a construction site for at least 3 consecutive

Table 3
Moderator Variable

Variable and items	*M*	*SD*	Range
Social support—(5-point scale: *Never* to *always*)			
Items loaded together to form one scale	23.69	5.34	7–30
1. How often does your immediate supervisor:			
(a) make an extra effort to make your work life easier for you?			
(b) make an extra effort to make your work life safer for you?			
(c) be relied upon to help you when a difficult situation arises at work?			
2. How often do your male coworkers:			
(a) make an extra effort to make your work life easier for you?			
(b) make an extra effort to make your work life safer for you?			
(c) be relied upon to help you when a difficult situation arises at work?			

Table 4
Zero-Order Correlations and Cronbach's Alphas for Job Stressors (Probabilities in Parentheses)

Scale	1	2	3	4	5	6	7	8	9	10	11
1. Control	.72										
2. Job demands	.057	.66									
	(.409)										
3. Job certainty	.353	.142	.73								
	(<.001)	(.044)									
4. Safety climate	.456	−.031	.238	.86							
	(<.001)	(.657)	(<.001)								
5. Training	.368	−.004	.171	.591	.69						
	(<.001)	(.951)	(.016)	(<.001)							
6. Daily exposure	−.134	.182	−.032	−.122	−.130	—					
	(.058)	(.009)	(.664)	(.088)	(.066)						
7. Sexual harrassment	−.162	−.028	−.242	−.312	−.184	.072	.75				
and discrimination	(.019)	(.687)	(<.001)	(<.001)	(.008)	(.307)					
8. Overcompensating	−.314	.237	−.170	−.246	−.131	.202	.229	—			
	(<.001)	(<.001)	(.016)	(<.001)	(.061)	(.004)	(<.001)				
9. Skill underutiliza-	−.332	−.102	−.300	−.378	−.266	.130	.131	.148	—		
tion	(<.001)	(.141)	(<.001)	(<.001)	(<.001)	(.066)	(.060)	(.033)			
10. Responsibility	.189	−.038	.128	.277	.161	.004	−.163	−.227	−.182	—	
	(.006)	(.583)	(.070)	(<.001)	(.021)	(.958)	(.018)	(.001)	(.008)		
11. Social support	.532	−.077	.222	.603	.439	−.184	−.286	−.376	−.421	.252	.86
	(<.001)	(.265)	(.002)	(<.001)	(<.001)	(.009)	(<.001)	(<.001)	(<.001)	(<.001)	

months during the previous year. At the beginning of the interview, the interviewer asked the respondent to think about either her current jobsite or the most recent one she had worked on in the past year. Throughout the interview the respondent was reminded to keep that job site in mind when answering the job site specific questions.

Analyses

We first conducted exploratory factor analyses on all of the items, as well as on sets of items thought to measure a specific construct, to establish a level of construct validity (Carmines & Zeller, 1979). Both the varimax (orthogonal) and promax (oblique) rotation results were considered in the scale formation. We then calculated Cronbach's alpha statistics on the resultant scales to assess their level of reliability (internal consistency; Rossi, Wright, & Anderson, 1983). Linear regression was used to evaluate the importance of each job stressor (Table 1) and social support interaction (Table 3) in predicting psychological symptoms. Using logistic regression, we analyzed the relationships between each of the dichotomous outcomes of job satisfaction, insomnia, nausea, and headaches, and the stressors and moderating variable.

Our modeling strategy was to first test for significance of the interaction terms described earlier (Social Support × Control; Social Support × Sexual Harassment and Discrimination) in a model containing the stressors and the potential confounders. Next, we assessed the potential confounding of age, marital status, and tenure. We hypothesized that as a tradeswoman gets older, has a social connection through marriage, and has already spent some time working in the industry, she might be more inclined to report higher levels of job satisfaction as well as lower psychological and physical symptoms than if she were younger, not married or living-as-if-married, and had a short tenure in the industry. Finally, to identify the most parsimonious model and yet still explain the data, we removed nonsignificant constructs, one at a time, weakest first, until only a significant ($p \leq .05$) set of stressors remained in the model. We verified our findings from this modeling method by executing the following variable selection procedures: backward elimination (elimination criterion, $p = .10$), stepwise selection (entry criterion, $p = .05$; elimination criterion, $p = .10$), and forward selection (entry criterion, $p = .05$) procedures. Statistical analyses were performed using SAS Version 12 (SAS Institute, 1997).

Results

Sample

Out of a total of 405 potential respondents, 31% (113 from Seattle and 13 from Portland, $N = 126$)

either could not be located or were ineligible to participate because they had not worked in construction for 3 consecutive months in the past year. This left a total of 279 potential respondents. Among the 252 remaining eligible participants in Seattle, 194 completed the survey (77% response rate). Among the 27 remaining eligible participants in Portland, 17 participated (63% response rate). This resulted in a 76% overall response rate (211/279).

Demographics, Means, and Zero-Order Correlations

The majority of the sample was White (78%), married or living with someone (57%), between 20 and 40 yrs of age (51%), and had worked in construction overall for less than 10 yrs (71%). Seventy-six percent worked in road–highway or commercial construction. All respondents were union members.

The means presented in Tables 1–3 suggest that the women in this study reported experiencing both a substantial amount of control on the jobsite as well as a high degree of job demands. They perceived there to be a strong safety climate on the jobsite and reported having a lot of responsibility for the safety of others on that site. They believed that they had been reasonably well trained for working in construction, reported relatively high levels of exposure to hazardous substances, and were fairly certain about their future job potential. However, 30% of the women said that they always, or almost always, felt they had to overcompensate at work, and 22% felt their skills were being always, or almost always, underutilized. Finally, although these workers did report a relatively high level of social support from coworkers and supervisors, 51% of the sample reported experiencing some form of sexual harassment or discrimination from coworkers or supervisors in the past year.

The zero-order correlations between the constructs of interest are presented in Tables 4 and 5. The strongest correlations identified were between supervisor–male coworker support and the following variables: safety climate ($r = .603$), control ($r = .532$), and job satisfaction ($r = .466$). Many of the other correlations, although statistically significant, had comparatively small correlation coefficients. This was probably due to the relatively large sample size.

Factor Analyses

For the most part, the items designed to measure specific constructs loaded on the expected factors. Items that did not load as expected or double loaded were removed from the scales or were used as single-item measures (discussed previously). The items measuring social support from male coworkers and supervisors loaded onto one factor and thus were combined into one scale. This is not surprising given the nature of the industry whereby foremen on the job (typically male workers) are typically considered to be both coworkers and supervisors. Social support from female coworkers, friends, and significant others was also measured. However, due to an

Table 5
Zero-Order Correlations for Job Stressors and Dependent Variables (Probabilities in Parentheses)

Independent variables	Dependent variables				
	Job satisfaction	Psychological symptoms	Insomnia	Headaches	Nausea
1. Control	.256 (<.001)	−.231 (<.001)	−.266 (<.001)	−.140 (.043)	−.114 (.101)
2. Job demands	−.056 (.419)	.002 (.980)	−.019 (.785)	−.013 (.851)	−.037 (.592)
3. Job certainty	.105 (.138)	−.201 (.004)	−.262 (000)	−.109 (.123)	−.176 (.013)
4. Safety climate	.315 (<.001)	−.063 (.367)	−.062 (.372)	.007 (.919)	−.155 (.026)
5. Training	.243 (<.001)	−.063 (.358)	−.063 (.367)	−.054 (.442)	−.109 (.119)
6. Daily exposure	−.135 (.055)	.128 (.069)	.064 (.366)	−.071 (.317)	.082 (.243)
7. Sexual harassment and discrimination	−.227 (<.001)	.242 (<.001)	.144 (.035)	.155 (.024)	.215 (.001)
8. Overcompensating at work	−.205 (<.001)	.213 (.001)	.240 (<.001)	−.087 (.209)	.040 (.568)
9. Skill under-utilization	−.320 (<.001)	.227 (<.001)	.203 (.003)	.057 (.411)	.128 (.064)
10. Responsibility for safety of others	.331 (<.001)	.081 (.241)	.003 (.962)	.007 (.915)	−.020 (.777)
11. Support supervisors/male co-workers	.456 (<.001)	−.210 (.002)	−.134 (.051)	.028 (.676)	−.122 (.076)
12. Job satisfaction	—				
13. Psychological symptoms	−.082 (.234)	—			
14. Insomnia	−.041 (.554)	.310 (<.001)	—		
15. Headaches	.009 (.888)	.273 (<.001)	.175 (.010)	—	
16. Nausea	−.214 (.002)	.349 (<.001)	.282 (<.001)	.344 (<.001)	—

excessive amount of unusable data (105 out of 211 respondents indicated "not applicable" to questions about social support from female coworkers; 55 respondents stated "not applicable" to questions about support from friends; 30 respondents indicated "not applicable" to questions about social support from significant others), these variables were dropped from further analyses.

As shown in Table 4, two of the eight scales had alphas significantly greater than .80 (supervisor–coworker support = .86; safety climate = .87). Three other scales had alphas above .70 (job certainty = .73; control = .72; harassment and discrimination = .75) and two others were above .65 (job demands = .66; training = .69). Alphas of this magnitude are generally considered acceptable (see Carmines & Zeller, 1979, and Nunnally, 1978).

Linear and Logistic Regression Analyses

Job satisfaction. When job satisfaction was modeled using logistic regression, the interaction terms were not significant, and the potential confounders, whether in or out of the model, did not markedly change the other parameter coefficients. Thus, these variables were eliminated from the model. The findings in Table 6 show that female construction workers who reported having greater responsibility for the safety of others were 59% more likely to have reported a greater degree of job satisfaction (odds ratio 1.59; 95% confidence interval = 1.05, 2.55). Also, on average, a one-unit increase in social support from supervisors and male coworkers was related to a 25% increased chance of reporting a greater level of job satisfaction (odds ratio 1.25; 95% confidence interval = 1.17, 1.36).

Psychological symptoms. When constructing the model for psychological symptoms using linear regression, the social support interactions were not statistically significant and age, marital status, and tenure did not influence the parameters in the model. Thus, they were not included in further analysis. The resultant model showing the relationships between job stressors and psychological symptoms is presented in Table 7. The

Table 6
Job Stressors Explaining Job Satisfaction

Job stressor	Odds ratio	95% Confidence interval
Responsibility for safety of others	1.59*	1.05, 2.55
Supervisor and male coworker support	1.25**	1.17, 1.36

Note. $n = 210$. Cases = 106; noncases = 105.
*$p < .04$. **$p < .001$.

Table 7
Job Stressors Explaining Psychological Symptoms

Job stressor	Parameter *M*	Parameter *SD*	Partial R^2
Responsibility for the safety of others	.456*	.155	.029
Skill underutilization	.339*	.103	.086
Sexual harassment and discrimination	.258*	.079	.055
Overcompensation at work	.254*	.088	.028

Note. $R^2 = .17$. Adjusted $R^2 = .15$, $n = 206$.
*All $ps < .001$.

unstandardized regression coefficients in the final model show that of all of the job stressors tested, having responsibility for the safety of others ($\beta = .456$; $p < .001$), skill under-utilization ($\beta = .339$; $p < .001$), experiencing sexual harassment and discrimination on the job ($\beta = .258$; $p < .001$), and having to overcompensate at work ($\beta = .254$; $p < .001$), were significantly related to higher reported levels of psychological symptoms. This model explained 15% of the variance of reported psychological symptoms.

Physiological symptoms. Again, using logistic regression and the same modeling strategy discussed earlier, we regressed each dichotomized physiological measure (insomnia, headaches, and nausea) on the job stressors, the selected social support interactions, and the potential confounders. As with the other models, the interaction terms and confounders were eliminated from the final model. The final models are reported in Tables 8, 9, and 10.

The findings in Table 8 show that, for the construction workers in this sample, a one-unit increase in reported levels of having to overcompensate at work related to a 41% increased risk of experiencing insomnia. Job certainty was found to be protective against insomnia. By taking the reciprocal of .854 (1/.854 = 1.17), we can interpret the coefficient as indicating that a one-unit decrease (since the odds ratio was below 1) in the job certainty scale was associated with a 17% increase in reported insomnia.

Finally, of all of the stressors tested, only the sexual harassment and discrimination scale had a statistically significant relationship with experiencing headaches and nausea. According to the findings reported in Tables 9 and 10, a one-unit increase in the reported level of sexual harassment and discrimination from supervisors and coworkers was associated with a 21% increase in reported headaches and a 33% increase in reported nausea.

Discussion and Conclusions

The goal of this study was to assess the relative impact of "classic" job stressors (e.g., job demands,

Table 8
Job Stressors Explaining Insomnia

Job stressor	Odds ratio	95% Confidence interval
Overcompensating at work	1.41*	1.14, 1.74
Job certainty	0.85*	.771, .942

Note. $n = 198$. Cases = 63; noncases = 135.
*$ps < .001$.

Table 10
Job Stressors Explaining Nausea

Job stressor	Odds ratio	95% Confidence interval
Sexual harassment and discrimination	1.33*	1.11, 1.60

Note. $n = 211$. Cases = 40; noncases = 137.
*$p < .01$.

control), gender-specific (e.g., sexual harassment and discrimination), and construction-specific (e.g., skills training) stressors as well as the moderating and direct effects of supervisor–coworker support on job satisfaction and psychological and physical health outcomes for a sample of female construction workers. Although, in general, the work environment appeared more favorable for the women construction workers in this study than might have been anticipated on the basis of earlier focus group data and data from similar, predominantly male occupations, a number of the potential stressors were significantly associated with job satisfaction and psychological and physiological symptoms.

In the present study, an important finding was that of the range of job stressors examined, sexual harassment and discrimination were the most consistent associated with psychological and physical symptoms, emerging in three of the four models tested. Although prevention of sexual harassment is not an Occupational Safety and Health Administration (OSHA) mandate, it may be one of the most prevalent occupational health hazards faced by women in the workplace (Kasinsky, 1992). The findings of the present study with regard to sexual harassment as a health risk were consistent with those of previous studies (Fitzgerald, 1993; Gutek & Koss, 1993). For example, Crull (1979) found that 96% of females subjected to a sexually hostile work environment experienced symptoms of emotional distress and that 63% experienced physical symptoms. In the 1981 U.S. Merit Systems study of Federal government workers (U.S. Merit Systems Protection Board, 1981), 42% reported that exposure to a sexually hostile work environment caused emotional or physical difficulties. There is some evidence that sexual harassment may be a unique type of job stressor with regard to its effects on health and work behaviors. A recent study by Schneider et al., 1997, found that even a relatively low frequency sexual harassment had a significant, negative impact on psychological well-being and work behaviors beyond the effects of general job stress.

Surprisingly, unlike the findings of a number of previous studies, the present study did not find that sexual harassment was a significant stressor for job satisfaction (Kissman, 1990; Mansfield, Koch, Henderson, & Vicary, 1991; O'Farrell & Harlan, 1982; Ragins & Scandura, 1995). However, these findings are consistent with those of Fitzgerald et al. (1994), who found that increased sexual harassment was related to lower job satisfaction with coworkers but not with the job itself. Yoder and Aniakudo (1995) found a similar relationship for female firefighters.

With respect to the additional stressors studied, the findings suggest that having responsibility for the safety of others might be somewhat of a double-edged sword for the workers in our sample. On one hand, with respect to job satisfaction, it had a positive effect. On the other hand, having this responsibility was negatively associated with psychological well-being. Both relationships have been reported in previous research (Murphy, 1991; Studenski & Barczyk, 1987). We can speculate that for these workers, there might be a cost as well as a benefit of having the responsibility for the safety of others. The benefits might be that being given this responsibility means you are accepted as part of the "group" and are treated as a coworker, which might enhance your self-esteem and lead to greater job satisfaction. The cost might be that given the dangerous nature of the construction site, this responsibility cannot be taken lightly, and, therefore, associated psychological outcomes might be inevitable.

Although having social support from supervisors–

Table 9
Job Stressors Explaining Headaches

Job stressor	Odds ratio	95% Confidence interval
Sexual harassment and discrimination	1.21	1.02, 1.43

Note. $n = 211$. Cases = 82; noncases = 129. $p = .03$.

male coworkers did not moderate the relationship between control, sexual harassment and discrimination, and job satisfaction (or for other outcomes evaluated), this type of support was shown to have a significant direct effect on job satisfaction. Other studies have shown that level of support from coworkers and supervisors is an important predictor of job satisfaction among blue-collar women (Kissman, 1990). Supervisor support was shown to be particularly important during the first year of work for women in nontraditional occupations (McIlwee, 1982) and for minimizing negative outcomes of job stressors overall (Ford, 1985). The main effects of social support on work stress outcomes have been evident in the job stress literature for at least a decade. A literature review by Williams and House (1985) reported that social support from supervisors had a direct but not buffering effect on job satisfaction. On a construction site, women are clearly in the minority, and supervisors create the organizational subculture within which the crew works. If a supervisor does not want a woman on his crew, he can make it both uncomfortable and unsafe for her to be there. Some tradeswomen have told of being assigned the most unpleasant and difficult tasks in a supervisor's effort to get the tradeswomen off of a crew (LeBreton and Loevy, 1992, pg. 16). Indeed, some tradeswomen in Oregon reported that having a supportive supervisor can make all the difference with respect to obtaining training, to not being harassed, and to being able to perform the work (Goldenhar, 1996).

Skill underutilization, as well as having to overcompensate at work, was associated with increased reported psychological symptoms. The latter was also associated with increased insomnia. Although these specific relationships have not been previously discussed, both skill underutilization and the need to overcompensate at work have previously been identified as job stressors for tradeswomen (Marshall, 1990), as well as women working in other nontraditional occupations (Johnson, 1991; Quinn & Woskie, 1988). One could argue that in some ways, the one stressor is the flip side of the other. That is, on the one hand, if a female construction worker is not given the chance to use her skills, it is difficult for her to prove that she is a competent worker. On the other hand, to be accepted as part of the crew, tradeswomen report that they find they have to overcompensate.

Workers who reported higher levels of job certainty were found to be protected against insomnia. The role of job certainty (job insecurity) in explaining mental and physical health outcomes has been previously documented (Ashford, Lee, & Bobko, 1989; Earnshaw, Amundson, & Borgen, 1990; Kuhnert & Palmer, 1991; Kuhnert, Sims, & Lahey, 1989). The construction industry is very transient in nature; projects start and finish, which creates a constant cycle of hiring and layoffs for both male and female workers. It is possible that this type of uncertainty could result in a person's inability to fall asleep or stay asleep.

This study has a number of limitations that need to be mentioned and addressed in future studies. These data are based on self-reports and were collected only from laborers in the Pacific Northwest. Therefore, the findings cannot be generalized to skilled tradeswomen in other crafts. It is unclear whether the groups surveyed are representative of the U.S. construction industry; the locals who were willing to participate may have a more positive attitude toward assimilation of women workers than the U.S. construction workforce as a whole. As noted earlier, we used a cross-sectional design. Therefore, even highly significant statistical associations cannot be taken to imply a cause and effect relationship. It would be ideal in future research to identify women entering the trades and study them prospectively over a period of years. Only 15% of the variance in psychological outcomes was explained by the stressors. This might be a function of the measurement of the dependent variable (only 3 items, measuring 3 different symptoms), or there are likely other stressors that we did not measure in this study. Finally, in future studies of this population, it would be ideal to obtain more detailed information on physical and psychological health outcomes, including more objective measures.

Using structural equation modeling procedures, future analyses of the data will examine the far right hand side of the model (see Figure 1). Outcomes presented in this article will be tested as mediator variables between the job stressors and the chronic outcomes of high blood pressure and work-related injuries. The existence of job stressors in construction has been put forth as one explanation for the high incidence of injuries on construction job sites (Kerr, 1957, as cited in Hinze, 1997). In addition it is vital that future research compare job stressor and outcome experience for both male and female laborers (and other construction tradespersons) to determine if similar models hold true across gender and across tradegroups.

In conclusion, the outcomes identified in this study might be diminished given a collaborative effort on the part of management, unions, and employees to continually make construction sites welcoming and

safe environments for all workers. The commitment on the part of management includes encouraging all workers to use their skills, to insist on safe behaviors, and to promote a sense of worker control over their work. Union and management policies against sexual harassment and discrimination need to be developed and enforced on all construction worksites. When organizations do not take steps to prevent harassment and discrimination, workers often perceive this as a message that harassment and discrimination are acceptable (Thacker, 1996). A "good" workplace climate, as evidenced by the valuing of diversity and active discouragement of harassment and discrimination, benefits all workers. Not only women, but also men, report distinct preferences for workplaces that are "friendly" to women and state that they intend to stay longer at such workplaces (Stokes et al., 1995).

Although the lack of retention of tradeswomen is often attributed to getting married, having children, or just not being physically or psychologically capable of performing the necessary tasks, perhaps these findings provide more empirical evidence about why some women might discontinue their construction careers. The construction industry is changing. The male labor pool is shrinking, and more women will be needed to do the work. Thus, it might be time for some organizational changes addressing the job stressors described here (e.g., increase women's opportunities to use their skills, decrease sexual harassment and discrimination) and to accommodate more women coming into the construction industry. Positive changes such as these might increase not only the retention rate, but also the recruitment of women into the construction trades, as well as create safer and healthier worksites for all workers.

References

Amick, B. C., & Celentano, D. D. (1991). Structural determinants of the psychosocial work environment: Introducing technology in the work stress framework. *Ergonomics, 34,* 625–646.

Ashford, S. J., Lee, C., & Bobko, P. (1989). Content, causes, and consequences of job insecurity: A theory-based measure and substantive test. *Academy of Management Journal, 32,* 803–829.

Brown, E. A., Campbell, E. A., & Fife-Schaw, C. (1995). Adverse impacts experienced by police officers following exposure to sex discrimination and sexual harassment. *Stress Medicine, 11,* 221–228.

Caplan, R. D., Cobb, S., French, J. R. P., Harrison, R. V., & Pinneau, S. R. (1975). *Job demands and worker health.* Washington DC: U.S. Government Printing Office.

Carmines, E. G., & Zeller, R. A. (1979). *Reliability and validity assessment.* Beverly Hills, CA: Sage.

Center to Protect Workers' Rights. (1997). *The construction chart book: The U.S. construction industry & its workers.* Washington DC: The Center to Protect Workers' Rights.

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrica, 16,* 297–354.

Crull, P. (1980). The impact of sexual harassment on the job: A profile of the experiences of 92 women. In D. Neugarten & J. Shafnty (Eds.), *Sexuality in organizations: Romantic and coercive behavior at work* (pp. 67–71). Oakdale, IL: Moore.

Dedobbeleer, N., & German, P. (1987). Safety practices in construction industry. *Journal of Occupational Medicine, 29,* 863–868.

DeJoy, D. M., Murphy, L. R., & Gershon, R. M. (1995). Safety climate in health care settings. In A. C. Bittner & P. C. Champey (Eds.), *Advances in industrial ergonomics and safety VII* (pp. 223–229). London: Taylor and Francis.

Earnshaw, A. R., Amundson, N. E., & Borgen, W. A. (1990). The experience of job insecurity for professional women. *Journal of Unemployment Counseling, 27,* 2–18.

Fitzgerald, L. F. (1993). Sexual harassment. *American Psychologist, 48,* 1070–1076.

Fitzgerald, L. F., Hulin, C. L., & Drasgow, F. (1994). The antecedents and consequences of sexual harassment in organizations: An integrated model. In G. P. Keita & J. J. Hurrell, Jr. (Eds.), *Job stress in a changing workforce: Investigating gender, diversity, and family issues* (pp. 55–73). Washington, DC: American Psychological Association.

Ford, D. L. (1985). Job-related stress of the minority professional. In T. A. Beer & R. S. Bhagat (Eds.), *Human stress and cognition in organizations* (pp. 287–323). New York: Wiley.

Goldenhar, L. M. (1996). [*Interviews with Oregon tradeswomen*]. Unpublished raw data.

Goldenhar, L. M., & Sweeney, M. H. (1996). Tradeswomen's perspectives on occupational health and safety: A qualitative investigation. *American Journal of Industrial Medicine, 29,* 516–520.

Goodman, L. A., Koss, M. P., & Russo, N. F. (1993). Violence against women: Physical and mental health effects. Part I: Research findings. *Applied and Preventive Psychology: Current Scientific Perspectives, 2,* 111–121.

Gruber, J. E., & Bjorn, L. (1982). Blue collar blues: The sexual harassment of women autoworkers. *Work and Occupations, 9,* 271–298.

Gutek, B. A., & Koss, M. P. (1993). Changed women and changed organizations: Consequences of and coping with sexual harassment. *Journal of Vocational Behavior, 42,* 28–48.

Gutek, B., & Morasch, B. (1982). Sex-ratios, sex-role spillover, and sexual harassment of women at work. *Journal of Social Issues, 38,* 55–75.

Hamilton, J. A., Alagna, S. W., King, L. S., & Lloyd, C. (1987). The emotional consequences of gender-based abuse in the workplace: New counseling programs for sex discrimination. *Women and Therapy, 6,* 155–182.

Hinze, J. W. (1997). *Construction safety.* Upsadle River, NJ: Prentice Hall.

Howard, S. (1991). Organizational resources for addressing sexual harassment. *Journal of Counseling and Development, 69,* 507–511.

Hurrell, J. J., Jr., & Colligan, M. J. (1982). Psychological job stress: An overview. In W. M. Rom (Ed.), *Occupational*

and environmental medicine (pp. 425–430). Boston: Little, Brown.

Hurrell, J. J., Jr., & McLaney, M. A. (1988). Exposure to job stress—A new psychometric instrument. *Scandinavian Journal of Work Environment and Health, 14,* 27–28.

Hurrell, J. J., Jr., & Murphy, L. R. (1992). Psychological job stress. In W. N. Rom (Ed.), *Environmental and occupational health* (2nd ed., pp. 675–685). Boston: Little, Brown.

Johnson, L. B. (1991). Job strain among police officers: Gender comparisons. *Police Studies, 14,* 12–16.

Kasinsky, R. G. (1992). Sexual harassment: A health hazard for women workers. *New Solutions, 2,* 74–83.

Kauppinen-Toropainen, K., & Gruber, J. E. (1993). Antecedents and outcomes of women-unfriendly experiences: A study of Scandinavian, former Soviet, and American women. *Psychology of Women Quarterly, 17,* 431–456.

Keita, G. W., & Hurrell, J. J., Jr. (Eds.). (1994). *Job stress in a changing workforce: Investigating gender, diversity, and family issues.* Washington DC: American Psychological Association.

Kissman, K. (1990). Women in blue-collar occupations: An exploration of constraints and facilitators. *Journal of Sociology and Social Welfare, 17,* 139–149.

Klonoff, E. A., & Landrine, H. (1995). The schedule of sexist events: A measure of lifetime and recent sexist discrimination in women's lives. *Psychology of Women Quarterly, 19,* 439–472.

Kuhnert, K. W., & Palmer, D. R. (1991). Job security, health, and the intrinsic and extrinsic characteristics of work. *Group & Organization Studies, 16,* 178–192.

Kuhnert, K. W., Sims, R. R., & Lahey, M. A. (1989). The relationship between job security and employee health. *Group & Organization Studies, 1,* 399–410.

Lafontaine, E., & Tredeau, L. (1986). The frequency, sources, and correlates of sexual harassment among women in traditional male occupations. *Sex Roles, 15,* 433–442.

Landrine, H., Klonoff, E. A., Gibbs, J., Manning, V., & Lund, M. (1995). Physical and psychiatric correlates of gender discrimination: An application of the schedule of sexist events. *Psychology of Women Quarterly, 19,* 473–492.

LeBreton, L. W., & Loevy, S. S. (1992). *Breaking new ground: WORKSITE 2000.* Chicago, IL: Chicago Women in the Trades.

Mansfield, P. K., Koch, P. B., Henderson, J., & Vicary, J. R. (1991). The job climate for women in traditionally male blue-collar occupations. *Sex Roles, 25,* 63–79.

Marshall, N. L. (1990). *Women in the trades: Final report of a survey of Massachusetts Tradeswomen* (Working Paper #195). Wellesley, MA: Wellesley College, Center for Research on Women.

Mattila, M., Hyttinen, M., & Rantanen, E. (1994). Effective supervisory behaviour and safety at the building site. *International Journal of Industrial Ergonomics, 13,* 85–93.

McIlwee, J. S. (1982). Work satisfaction among women in nontraditional occupations. *Work and Occupations, 9,* 299–335.

McNair, D. M., Lorr, M., & Droppleman, L. F. (1981). Profile of Mood States. San Diego, CA: Educational and Industrial Testing Service.

Morrow, P. C., McElroy, J. C., & Phillips, C. M. (1994). Sexual harassment behaviors and work related perceptions and attitudes. *Journal of Vocational Behavior, 45,* 295–309.

Murphy, L. R. (1991). Job dimensions associated with severe disability due to cardiovascular disease. *Journal of Clinical Epidemiology, 44,* 155–166.

Nelson, D. L., & Hitt, M. A. (1992). Employed women and stress: Implications for enhancing women's mental health in the workplace. In J. C. Quick, L. R. Murphy, & J. J. Hurrell, Jr. (Eds.), *Stress and well-being at work: Assessments and interventions for occupational mental health* (pp. 164–177). Washington, DC: American Psychological Association.

Newell, C. E., Rosenfeld, P., & Culbertson, A. L. (1995). Sexual harassment experiences and equal opportunity perceptions of navy women. *Sex Roles, 32,* 159–167.

Northwestern National Life Insurance Company. (1991). *Employee burnout: America's newest epidemic.* Minneapolis, MN: Northwestern National Life Insurance Co.

Northwestern National Life Insurance Company. (1993). *Fear and violence in the workplace survey documenting the experience of American workers.* Minneapolis, MN: Northwestern National Life Insurance Co.

Nunnally, J. C. (1978). *Psychometric theory* (2nd ed.). New York: McGraw-Hill.

Occupational Safety and Health Administration, Workgroup of the Advisory Committee on Construction Safety and Health. (1997). *Women in the construction workforce: Providing equitable safety and health protection.* (A working paper of Health and Safety of Women in Construction [HASWIC]). Washington, DC: Author.

O'Farrell, B., & Harlan, S. L. (1982). Craftworkers and clerks: The effect of male coworker hostility on women's satisfaction with non-traditional jobs. *Social Problems, 29,* 252–265.

Quinn, R., & Cobb, W., Jr. (1971). *What workers want: Factor analyses of important ratings of job facets.* Ann Arbor, MI: Survey Research Center.

Quinn, R., & Staines, G. (1979). *The 1977 Quality of Employment Survey.* Ann Arbor, MI: Survey Research Center.

Quinn, M. M., & Woskie, S. R. (1988). Women and work. In B. S. Levy & D. H. Wegman (Eds.), *Occupational health: Recognizing and preventing work-related disease* (2nd ed., pp. 479–499). Boston: Little, Brown.

Ragins, B. R., & Scandura, T. A. (1995). Antecedents and work-related correlates of reported sexual harassment: An empirical investigation of competing hypotheses. *Sex Roles, 32,* 429–455.

Reich, R. B., & Nussbaum, K. (1994). *Working women count! A report to the nation.* Washington DC: U.S. Department of Labor, Women's Bureau.

Reimer, J. (1979). *Hard hats: The work world of construction workers.* Beverly Hills, CA: Sage.

Rosell, E., Miller, K., & Barber, K. (1995). Firefighting women and sexual harassment. *Public Personnel Management, 24,* 339–350.

Rossi, P. H., Wright, J. D., & Anderson, A. B. (1983). *Handbook of survey research.* Orlando, FL: Academic Press.

Russo, N. F. (1995). Women's mental health: Research agenda for the twenty-first century. In B. Brown, B. Kramer, P. Reiker, & C. Willie (Eds.), *Mental health, racism, and sexism* (pp. 373–396). Pittsburgh, PA: University of Pittsburgh Press.

SAS Institute Inc. (1997). SAS (Version 12) [Computer software]. Cary, NC: Author.

Schneider, K. T., Swan, S., & Fitzgerald, L. F. (1997). Job-related and psychological effects of sexual harassment in the workplace: Empirical evidence from two organizations. *Journal of Applied Psychology, 82,* 401–415.

Schroedel, J. R. (1990). Blue collar women: Paying the price at home and on the job. In H. Y. Grossman & N. L. Chester (Eds.), *The experience and meaning of work in women's lives* (pp. 241–260). Hillsdale, NJ: Erlbaum.

Stokes, J., Riger, S., & Sullivan, M. (1995). Measuring perceptions of the working environment for women in corporate settings. *Psychology of Women Quarterly, 19,* 533–549.

Studenski, R., & Barczyk, J. (1987). Occupational stressors in mining as related to health, job, attitudes and accident making. *Polish Psychological Bulletin, 18,* 159–168.

Swanson, N. (1997). Unpublished raw data.

Swanson, N. G., Piotrkowski, C. S., Keita, G. P., & Becker, A. B. (1997). Occupational stress and women's health. In S. J. Gallant, G. P. Keita, & R. Royak-Schaler (Eds.), *Health care for women: Psychological, social and behavioral influences* (pp. 147–159). Washington, DC: American Psychological Association.

Tallichet, S. E. (1995). Gendered relations in the mines and the division of labor underground. *Gender and Society, 9,* 697–711.

Thacker, R. A. (1996). A descriptive study of situational and individual influences upon individual's responses to sexual harassment. *Human Relations, 49,* 1105–1122.

Thacker, R. A., & Gohmann, S. F. (1996). Emotional and psychological consequences of sexual harassment: A descriptive study. *The Journal of Psychology, 130,* 429–446.

U.S. Department of Labor, Bureau of Labor Statistics. (1995). *Current population survey earnings files, Employment and Earnings Division.* Washington, DC: Author.

U.S. Merit Systems Protection Board. (1981). *Sexual harassment in the federal workplace: Is it a problem?* (Report to the President and the Congress). Washington, DC: U.S. Government Printing Office.

U.S. Merit Systems Protection Board. (1995). *Sexual harassment in the federal workplace: Trends, progress, and continuing challenges.* (Report to the President and the Congress). Washington, DC: U.S. Government Printing Office.

Walshok, M. L. (1981). *Blue collar women: Pioneers on the male frontier.* Garden City, NY: Anchor Press/Doubleday.

Wanous, J. P., Reichers, A. E., & Hudy, M. J. (1997). Overall job satisfaction: How good are single-item measures? *Journal of Applied Psychology, 82,* 247–252.

Weaver, C. L., Gunto, S. J., Berger, P. K., & Dwyer, R. (1996). Perceptions of site worker training and job issues by women, minorities, and White males: Survey results and recommendations to improve training. *New Solutions, 6,* 59–67.

Williams, D. R., & House, J. (1985). Social support and stress reduction. In C. L. Cooper & M. J. Smith (Eds.), *Job stress and blue collar work* (pp. 207–223). New York: Wiley.

Yoder, J. D., & Aniakudo, P. (1995). The responses of African American women firefighters to gender harassment at work. *Sex Roles, 32,* 125–137.

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Descript: Publishes research, theory and public policy articles in **occupational health psychology**. Focuses on the work environment, the individual, and the work-family interface.