WORK STRESS

Studies of the Context, Content and Outcomes of Stress

A Book of Readings

Edited by
Chris L. Peterson

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Work Stress

Chapter 4

EFFECTS OF ORGANIZATIONAL DOWNSIZING ON WORKER STRESS AND HEALTH IN THE UNITED STATES

Lawrence R. Murphy and Lewis D. Pepper

Downsizing and restructuring, involving large-scale layoffs, have been adopted over the last decade as a management tool with the purported aim of strengthening a company or agency by reducing budgets and personnel. During 2001, 21,345 mass layoff events occurred in the United States, resulting in 2,496,784 initial claims filings for unemployment insurance. The Mass Layoff Statistics program, maintained by the U.S. Department of Labor's Bureau of Labor Statistics, reports on mass layoff actions that result in workers being separated from their jobs. Both the number of events and the number of initial claimants in 2001 were the highest in the nearly seven-year history of the program. Manufacturing accounted for 42 percent of all mass layoff events and 49 percent of initial claims filed during 2001, the largest annual shares to date (1).

Sometimes downsizing is associated with a partial or complete restructuring, while at other times it is simply a reduction in the number of employees. Much downsizing has been implemented without information about the health impacts on remaining employees and the organizational and productivity costs. Often, corporate executives are rewarded financially after a downsizing event, and stock prices increase. But these stock increases are often temporary. For instance, stock prices of firms that downsized during the 1980s fell short of industry averages in the 1990s (2), and two-thirds of companies that downsize will downsize again within a year (3). In a study of more than 300 companies that downsized employees by more than 3 percent annually from 1980 to 1990, Cascio (4) found that downsizing did not lead to an improvement in company financial performance. Finally, Cascio and coworkers (5) examined the financial performance of firms that engaged in employment downsizing during the period 1981–92 and found no significant increase in profitability due to downsizing,

when compared with industry averages. Taken together, these findings question whether downsizing is an effective tool for improving financial performance or creating a more efficient and competitive organization.

In addition, there is growing evidence of significant organizational consequences of downsizing. In a study by the American Management Association, 40 percent of organizations responding reported that productivity had sagged after downsizing, and nearly one-fifth reported that quality had suffered. This study also documented a decline in morale (reported by 58 percent of companies) and greater employee turnover (6). Likewise, Sommer and Luthans (7) found a decrease in organizational commitment, in trust among coworkers, and in job satisfaction following a downsizing event at a health care organization. Other studies have documented decreases in job security, organizational commitment, trust among coworkers, and job satisfaction, and increases in workplace conflict after downsizing (7).

Most research has focused on the effects of downsizing on workers' health and well-being. Noer (8) examined individual responses to downsizing and identified common symptoms of fear, insecurity, frustration and anger, sadness, and sense of unfairness as well as reduced risk-taking and lowered productivity. Noer named this compilation of symptoms "survivor syndrome," a syndrome that was originally identified in studies of survivors of Hiroshima/Nagasaki and the Holocaust. A follow-up study of organizations implementing layoffs found that many of these symptoms persisted for five years, although employees had become resigned to the outcomes (8). Still other studies have reported that the threat of downsizing can lead to deteriorated health, increased work demands, and tension in the workplace (9–11). A few studies (summarized in 7) found negative personal and job outcomes associated with downsizing. Cameron and colleagues (12), for instance, found significant associations between downsizing and decreased morale and increased conflict in the workplace. In an early review of the literature, Kozlowski and colleagues (13) noted the impacts of downsizing on interpersonal relationships, physical health, and emotional health. A recent study found that the effects of downsizing on employees' attitudes decrease over time and that one year later, their attitudes began returning to pre-downsizing levels (14). The implication for organizations that engage in repeated episodes of downsizing is clear: employees' attitudes will not have a chance to recover over time, and so will remain low.

Aside from the effects of downsizing per se, other research has established the importance of the process of downsizing, that is, *how* downsizing is accomplished. Brockner and colleagues (15–17) report that employees' perceptions of fairness, openness, and justice moderate the effects of downsizing on health and productivity. In addition, a literature is emerging about workers' perceptions of fairness in how decisions are made and implemented. Research to date shows that perceptions of fairness are important in the workplace and should be considered as an independent variable when analyzing organizational functioning and employees' health (18–21).

Likewise, Parker and coworkers (22), studying a company that had introduced planned employment changes (strategic downsizing), followed employees over a four-year period after downsizing. Although job demands increased after downsizing, employees' well-being and job satisfaction did not decrease. The authors concluded that the managed, strategic downsizing actually improved employees' sense of control, because of new work characteristics introduced as part of the reorganization. The authors suggested that when downsizing is planned or strategic, not reactive, and when it fosters employees' involvement, adverse outcomes do not necessarily occur.

This chapter examines the effects of downsizing on worker stress, coping, survivor syndrome health, and job security in two sites that represent extremes of downsizing. One site (site B) had been engaged in repeated episodes of downsizing since 1992; the other site (site A) had a single downsizing episode the year before the data were collected. The two sites also differed in the type of layoffs that occurred. In site A, all the layoffs were voluntary (e.g., early retirement), while at site B, about half of the workers lost their jobs through involuntary layoffs.

We proposed two hypotheses. The first is that survivor syndrome, job stress, and health symptoms will be higher, and coping and job security will be lower, at a site with multiple episodes of downsizing (site B, high downsizing) than at a site with a single episode of downsizing (site A, low downsizing). The second hypothesis is that the correlation between site and measures of survivor syndrome, job stress, coping, and job security will be minimized after adjusting for downsizing process variables (i.e., *fairness* of procedures, *openness* of communication, and *opportunities* for more creative and interesting work).

METHOD

Background

Following the dissolution of the Soviet Union and the end of the nuclear arms race, the U.S. Department of Energy (DOE) and the nuclear defense industry embarked on a process of changing the agency's mission and determining appropriate staffing levels reflecting this change. Anticipating future layoffs, Section 3161 of the National Defense Authorization Act for Fiscal Year 1993 outlined an approach to planning and implementing workforce layoffs consistently across the nuclear weapons industry. Section 3161 also identified objectives that each plan should address; these included minimizing social and economic impacts; giving workers adequate notice of impending changes; minimizing involuntary separations; offering preference-in-hiring to the extent practicable to those employees involuntarily separated; providing relocation assistance

under certain conditions; providing retraining, educational, and outplacement assistance; and providing local impact assistance to affected communities.

In 1994 the DOE introduced the Strategic Alignment Initiative, a planning process that shifted core DOE missions from defense production to environmental management and the cleanup of radioactive and hazardous waste at 15 major locations in 13 states. The planning process involved a variety of changes, including reductions in the workforce, restructuring of contractor organizations, and the planned closure of certain facilities. Although the shift from arms production to environmental management was expected to produce a one-time major reduction in the workforce, layoffs continued into 1995 and beyond, driven by budget reductions and the realization that the number of retained production workers exceeded actual demand.

Study Sites

Site A. This site was located in the southwestern United States. Its principal mission was assembling and disassembling nuclear weapons. The mission has included fabricating chemical explosives for nuclear weapons, assembling nuclear weapons for the nation's stockpile, maintaining and evaluating nuclear weapons in the stockpile, and disassembling nuclear weapons retired from the stockpile. In response to the funding cutbacks, site A created and implemented a three-phase restructuring plan. Part I included a hiring freeze and preparation of the workforce layoff plan; phase II consisted of a voluntary separation incentive program (VSIP); and phase III consisted of allowing approved VSIPs to use the career transition center and preparing for an involuntary reduction in force.

The hiring freeze was instituted in April 1996. A workforce transition team—chaired by the human resources manager and consisting of managers of other divisions, including the equal employment opportunity/affirmative action department and the union leadership—was formed in March 1996 to oversee the process and contribute to the DOE workforce restructuring plan. The workforce planning team and division managers identified affected positions by (*a*) determining the functions required to accomplish plant missions, (*b*) determining the number of employees required to carry out those functions and the necessary skill level, and (*c*) grouping employees with similar skill levels within specific plant functions into peer groups. Affected positions were identified among various peer groups.

In December 1996, it was announced that 350 positions were to be eliminated and offered a VSIP, which included a cash incentive, extended medical benefits, educational assistance, and outplacement services. No involuntary downsizing was required, since the number of voluntary separations was sufficient. Leaders from the Metal Trades Council and the International Guards Union of America were invited to all meetings of the workforce transition team and approved the process for granting VSIPs to bargaining unit employees. Letters from the general manager discussing the planning process were printed on the front page of the employee newsletter. Between December 1996 and February 1997, at least 11 written communications were distributed on impending deadlines, answers to commonly asked questions, and updates on numbers of employees who had applied for the VSIP or for internal transfers. The written communications, video, and employee packet each described aspects of the process.

A career transition center was opened in 1997; it offered a full range of services, including free workshops on networking, resume writing, interviewing, and financial planning. Computers, phones, and copiers were made available to individuals for job searches. Career counselors were available for individual sessions.

Site B. This site was located in the Midwestern United States. It had traditionally produced highly enriched uranium and other components for nuclear weapons, but its new mission included dismantling nuclear weapons, manufacturing weapons components, warehousing nuclear materials for defense capabilities, and transferring technology. Reorganization and downsizing had been fairly constant at this site since 1992. Reduction-in-force (RIF) events occurred nearly every year to adjust to budget reductions. In 1993, the rationale for downsizing expanded to include changing missions and the need to decrease the workforce while maintaining "unique and critical positions." Reduced budgets continued to drive the downsizing over the entire study period, with particularly large cuts in funding environmental management work in 1996. While the defense mission remained throughout this period, production capacity needed to be reduced. Management determined that a RIF was again necessary and reviewed eight possible reduction plans. It offered an early retirement incentive plan to attract enough employees and not lose those with needed skills. By 1998, when a voluntary RIF was offered (with severance pay), management had adopted the term of "surplus positions" to identify those eligible to apply.

Downsizing plans at the site were reviewed by the director of equal employment opportunity/affirmative action and reviewed and approved by the vice president for human resources. Monetary incentives for voluntary and involuntary layoffs included severance pay (usually one week of salary per year of service); educational assistance (usually $10,000 over four years, starting within one year of RIF); extended medical insurance, with the employee paying increasing amounts; and relocation assistance. Involuntary reductions of bargaining unit employees were carried out based on seniority and contract provisions. Involuntary reductions of salaried employees included several distinct actions: (*a*) business managers determined the number of full-time employees that could be supported by the site budget, and allocated those positions by division; (*b*) division leaders identified positions subject to the RIF and openings available for internal placement; and, (*c*) managers ranked individuals in targeted areas or job categories.

Management developed a list of stakeholders in the workforce reduction process, including union representatives; all stakeholders received announcements about reduction plans, and a forum was established to discuss workforce reductions and to initiate mitigation activities in April 1992. Finally, a placement center was opened in 1993 to assist with a variety of testing (interest, aptitude), counseling (psychological, job), skill workshops, and job search efforts. The workforce restructuring task group worked with human resources to reduce the impact of the RIFs. Activities included area needs analyses, internal placements, measures to mitigate the impact on community, and retraining programs for separated workers.

Training was viewed as a key long-term strategy to reduce both layoffs and the impact of layoffs. The program helped RIFed workers to find new jobs, and sought to make "survivors" or retained workers more versatile and to fill in where skills had been depleted by the layoffs. Training courses were offered in areas where new missions were developing and a job was likely at the end of the training.

Table 4.1 presents a summary of the downsizing events experienced at the two study sites from January 1991 through June 1998.

Sampling

At site A, 1,179 employees were randomly invited to participate in the study (41.2 percent of the total workforce in 1998). This site had 11 divisions, ranging in size from 27 to 152 employees, with three divisions having fewer than 100 employees. Each division was a sampling unit and approximately 40 percent of employees in each sampling unit were randomly included in the survey sample. At site B, 2,442 employees were randomly invited to participate in the study (43 percent of the total workforce in 1998). There were 46 divisions at the site, ranging in size from 1 to 178 employees, with 29 divisions having fewer than

Table 4.1

Descriptive information on downsizing events at the two study sites

	Site A	Site B
No. of annual downsizing/restructuring episodes since 1991	1	5
Total no. of workers affected by downsizing since 1991	321	4,270
Total no. expressed as percent of original workforce in 1991	15%	52%
Percent of layoffs that were voluntary (early retirement, etc.)	100%	74%
Year of most recent layoffs	1997	1997
Percent voluntary layoffs in most recent downsize (1997)	100%	45%

100 employees. Twelve divisions had fewer than 20 employees (2 to 18 people), and we combined them, based on functional and hierarchical similarity, into three groups for the purpose of sampling. This resulted in a total of 36 sampling units. Approximately 40 percent of employees in each sampling unit were randomly included in the survey sample for site B.

Data-Collection Procedure

Surveys were first mailed to sampled employees in August 1998. One researcher visited the site to encourage participation and was available for questions and to collect completed surveys. Thank-you letters were sent two weeks after the survey to all sampled employees. Employees were asked to return the anonymous survey and a separate postcard with their name to indicate completion of the survey. Two additional reminder mailings were sent to all those who did not return a postcard.

Survey Development

Interviews with employees, focus group discussions, and reviews of relevant literature were used to identify important themes or constructs to include in the employee survey. Where possible, we used existing scales or individual items, but a number of new items and scales were used in this study, including scales to measure three downsizing process variables: *fairness* of the downsizing rules and procedures, *openness* of communication, and *opportunities* for more interesting and creative work as a result of the downsizing. The opportunities scale was developed as a result of comments received during focus group discussions about the absence of any measures of positive effects of downsizing.

The draft survey was pilot-tested at the study sites in 1997 and was revised based on workers' comments solicited during debriefing sessions. The final survey took about 30 minutes to complete and was divided into six major sections (demographic information—age group, race, marital status, education level, tenure at the site, and income; job characteristics; health and health behavior information; assessment of organizational change; and organizational climate). In this report, only a portion of the items and scales are analyzed.

Independent Variables

Three scales were developed for this study to measure downsizing process variables, that is, how downsizing was accomplished at the site. The response format for all three scales was a five-point, "strongly agree" to "strongly disagree" scale (unless otherwise noted, all scales in this study used this five-point format).

Fairness was measured with four items: "during the restructuring process, consistent rules and procedures were followed"; "the rules and procedures for restructuring were fair"; "decisions about who to layoff were made fairly"; and

"during the restructuring process, employees were treated fairly." The alpha coefficient for both sites A and B was 0.86. *Open communication* was measured using five items: 'the reasons for restructuring were clearly explained to me by my supervisor"; "during the restructuring process, I had the chance to express my views to management"; "employees were included in making decisions about restructuring"; "employees were given enough notice about the restructuring"; and "my supervisor dealt with me in a truthful manner during the restructuring process." The alpha coefficients for sites A and B were 0.75 and 0.76, respectively. *Opportunity at work* was measured using seven items: "as a result of the restructuring that took place, I now have the opportunity to make better decisions"; ". . . to make quicker decisions"; ". . . to learn new things"; ". . . for more interesting work"; ". . . to be more creative"; ". . . to eliminate unnecessary work"; ". . . for better career growth and development." The alpha coefficient for both sites A and B was 0.91.

Dependent Variables

Downsizing *survivor syndrome* was measured using five items developed for this study. The items tapped the major elements of the syndrome that are commonly present as a result of downsizing: "as a result of the downsizing at this facility, I have been feeling frustrated"; "I have been feeling guilty"; "I have been feeling sad"; "I tend to blame others when things do not go well"; "I like to be left alone"; "I have no desire to get involved with additional work activities." The response format was a five-point, "much less often" to "much more often" scale. The alpha coefficients for sites A and B were 0.79 and 0.69, respectively.

Stress symptoms were measured using four items taken from Cohen and coauthors' perceived stress scale (23), which used a five-point "never" to "very often" response format. The items were "during the past month, how often have you: (*a*) felt you were unable to control the important things in your life, (*b*) felt confident about your ability to handle personal problems, (*c*) felt that things were going your way, (*d*) felt that difficulties were piling up so high that you could not overcome them?" The alpha coefficient for both sites A and B was 0.67.

Work stress was measured using a single item: "during the past month, I have experienced a lot of stress at work." *Coping* was measured using two items: "I deal effectively with the stress at this site" and "I am able to maintain a healthy balance between my work life and my home life." The alpha coefficients for sites A and B were 0.66 and 0.72, respectively.

Physical health symptoms was measured using a "yes" or "no" checklist containing seven items: "Have any of the following problems been bothering you in the past 30 days: headaches, rapid breathing, difficulty breathing, racing heart, irregular heartbeats or flutters, chest pain, backache?" The alpha coefficients for sites A and B were 0.77 and 0.74, respectively.

Job security was measured using a single item: "my job security is good" on a four-point "not at all true" to "very true" response scale.

RESULTS

Table 4.2 shows demographic data for the two study sites. Site A (single episode of downsizing, voluntary layoffs) had more workers in the younger age groups and fewer workers in the 50 to 59 age group than at site B (multiple downsizing, involuntary and voluntary layoffs). Likewise, more workers at site A were in the lower tenure groups than at site B and a higher percentage of the workforce was white. The two sites were similar with respect to sex, education, marital status, and income group.

Table 4.3 shows mean scores and univariate F tests for all study variables. Significant differences between sites are evident for age group, race, and tenure group ($P \leq .001$) but not for the remaining demographics. However, the two sites differed significantly on all independent and dependent variables ($P \leq .001$), with site B having poorer scores than site A. The results support our first hypothesis.

Table 4.4 shows correlations among all study variables. The pattern of correlations is very similar between the two sites. The demographic variables do not correlate highly with any of the independent or dependent variables. The largest correlation is between income group and worker ratings of open communication during downsizing (site A, $r = .12$; site B, $r = .11$).

Correlations among the dependent variables are small to moderate, ranging from $r = 0.10$ to 0.42. However, coping and stress symptom scales correlate at 0.53 and 0.51, for sites A and B, respectively, and work stress correlates with coping at –0.42 and –0.36. Three downsizing process variables correlate moderately (range, 0.35 to 0.40), except for the fairness and openness scales, which correlate at 0.70 in site A and 0.71 in site B. Apparently, these two aspects of the downsizing process are very closely linked and may not be distinct constructs, at least for the two sites in this study.

We tested our second hypothesis using hierarchical stepwise multiple regression for the six outcome variables; the results are shown in Table 4.5. Separate regressions were run for each outcome variable, and each regression followed the same hierarchical procedure. At step 1, the site variable was entered into the model (site was dummy coded: site A = 0, site B = 1). At step 2, the demographic variables were entered in stepwise fashion and the model R^2 calculated. Only variables that were significant remained in the model for the next step. Fairness was entered at step 3, openness at step 4, and opportunity at step 5. In this approach, changes in the regression coefficient for site reveal progressive removal of non-unique variance. At the last step, the standardized regression coefficient for site reflects site differences in the outcome variable adjusted for all other factors. After adjustment, the site variable carries information about downsizing history (single episode, voluntary layoffs vs. multiple episodes, some

Table 4.2

Means, standard deviations, and results of univariate F test

	Percent of sample	
	Site A (N = 779) (single episode, all voluntary layoffs)	Site B (N = 1,162) (multiple episodes, with involuntary layoffs)
Age group		
20–29	5	1
30–39	24	16
40–49	39	40
50–59	25	37
60+	7	6
Sex		
Male	70	70
Race		
White	85	92
Black	5	6
Hispanic	7	1
Other	3	1
Education		
High school	25	26
Some college	20	27
Bachelor's degree	37	29
Advanced degree	18	18
Marital status		
Married	80	81
Single	5	5
Separated	1	1
Divorced	13	12
Widowed	1	1
Tenure at site		
0–4 yrs	21	6
5–9 yrs	25	15
10–14 yrs	12	15
15-19 yrs	20	21
20–24 yrs	10	22
25 or more yrs	12	21
Income		
$30,000–$60,000	51	52
$60,001–$90,000	34	31
$90,001 and above	15	17

Note: Percentages may not add to 100% due to missing values.

Table 4.3

Means, standard deviations, and results of univariate F test

	Site A (N = 779)		Site B (N = 1,170)		
	Mean	S.D.	Mean	S.D.	Sig.
Age group	3.05	0.98	3.31	0.84	.001
Race (white = 1; other = 0)	0.85	0.36	0.92	0.26	.001
Sex (male = 1; female = 0)	0.70	0.46	0.70	0.46	N.S.
Education	2.37	0.96	2.39	1.06	N.S.
Marital status (married = 1; other = 0)	0.80	0.40	0.81	0.39	N.S.
Income group	3.64	0.73	3.66	0.76	N.S.
Tenure group	3.09	1.66	3.99	1.54	.001
Stress symptoms	2.06	0.73	2.27	0.73	.001
Work stress	2.99	1.13	3.28	1.14	.001
Good coping	3.86	0.68	3.66	0.76	.001
Survivor syndrome	2.92	0.56	3.10	0.54	.001
Perceived job security	2.70	0.88	2.35	0.94	.001
Health symptoms	0.40	0.18	0.45	0.20	.001
Fairness	2.92	0.86	2.61	0.82	.001
Openness of communication	2.88	0.69	2.64	0.7	.001
Post-downsizing opportunities at work	2.81	0.59	2.62	0.65	.001

involuntary layoffs). One can also see the relative strength of each variable in the final model by directly comparing the standardized regression coefficients shown in the last column in Table 4.5.

For example, the first row of Table 4.5 shows the results for the downsizing survivor syndrome scale. The unadjusted regression coefficient for site is 0.17, indicating that site B (dummy code = 1) has higher scores on survivor symptoms than site A (dummy code = 0). The size of the coefficient for site remains unchanged when the demographics are entered, but drops to 0.12 when the fairness scale is entered. The R^2 increases from .06 to .12 when fairness is added to the model. In step 5, the coefficient for site drops to .11 and the model R^2 increases to .16. Across steps 1 through 5, the model R^2 increases from .03 to .16. Thus, the unique contribution of site to survivor syndrome is reduced as the downsizing process variables are entered into the model, but remains significant in the model. The final column of Table 4.5 shows the variables that remain statistically significant in the final model, with standardized regression coefficients shown in parentheses. Opportunity is the strongest predictor of survivor symptoms (–.22), followed by fairness (–.16), education (.16), site (.11), and race (.06).

Table 4.4

Correlations (r) among the variables—site A below the diagonal; site B above the diagonal

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Age group	—	-0.01	0.18	-0.09	0.00	0.05	0.45	-0.08	-0.13	0.01	-0.03	0.12	-0.10	0.04	0.03	0.00
2	Race	0.05	—	0.05	-0.08	0.10	0.01	0.00	0.02	0.03	0.00	0.01	0.10	-0.01	0.06	0.06	0.02
3	Sex	0.15	0.00	—	-0.01	0.25	0.03	0.19	-0.10	-0.08	0.02	-0.01	0.09	-0.16	0.03	0.01	-0.03
4	Education	-0.04	0.14	0.08	—	0.05	0.31	0.12	0.11	0.15	-0.07	0.13	-0.06	-0.09	0.02	0.08	0.01
5	Marital status	0.08	0.05	0.23	0.06	—	0.27	0.04	-0.01	-0.01	0.01	0.04	0.03	-0.04	0.02	0.02	0.02
6	Income group	0.10	0.09	-0.05	0.31	0.39	—	0.05	0.04	0.05	-0.03	0.11	-0.01	-0.04	0.08	0.11	0.00
7	Tenure group	0.47	-0.07	0.10	-0.11	0.05	0.07	—	0.01	-0.05	-0.04	-0.01	0.12	-0.02	0.05	0.03	-0.06
8	Stress symptoms	-0.13	0.02	-0.08	0.11	-0.01	-0.05	0.04	—	0.34	-0.51	0.25	-0.18	0.20	-0.17	-0.12	-0.18
9	Work stress	-0.08	0.07	-0.01	0.15	0.01	-0.08	0.00	-0.36	—	-0.36	0.22	-0.17	0.17	-0.18	-0.15	-0.24
10	Good coping	0.03	-0.02	-0.06	-0.07	0.05	0.02	0.04	-0.53	-0.42	—	-0.26	0.21	-0.22	0.19	0.20	0.23
11	Survivor syndrome	-0.01	0.11	0.06	0.13	0.05	0.08	0.02	0.26	0.29	-0.31	—	-0.18	0.10	0.27	0.22	-0.29
12	Job security	0.05	0.04	-0.04	-0.06	-0.01	0.08	0.13	-0.12	-0.19	0.16	-0.16	—	-0.12	0.24	0.24	0.22
13	Health symptoms	0.01	-0.01	-0.12	0.01	-0.08	-0.04	-0.04	0.16	0.11	-0.15	0.08	-0.02	—	-0.18	-0.14	-0.13
14	Fairness	0.02	-0.02	0.02	-0.02	0.00	0.04	0.06	-0.15	-0.25	0.22	-0.21	0.26	-0.10	—	0.71	0.40
15	Openness	-0.04	0.04	-0.06	0.08	0.03	0.12	0.12	-0.11	-0.18	0.18	-0.19	0.24	-0.07	0.70	—	0.42
16	Opportunity	-0.08	0.01	-0.08	0.01	-0.05	0.04	0.06	-0.18	-0.20	0.28	-0.28	0.22	-0.06	0.35	0.37	—

Note: Coding: sex (male = 1, female = 0); race (white = 1, other = 0); marital (married = 1, other = 0).

A similar pattern is evident for coping, the stress symptom scale, and health status. In each case, the addition of the downsizing process variables decreases the coefficient for site and increases the model R^2. In each model, *opportunity* (for better and quicker decision-making, to learn new things, to do more interesting work, and to be more creative) and *fairness* of the downsizing process are the best predictors of each outcome, with site and education level remaining significant in the final regression models.

The regression model for job security shows a slightly different pattern. The addition of demographics to the model increases the coefficient for site, and the site variable has the largest regression coefficient in the final model, followed by tenure, opportunity, and fairness. Similar to other outcome measures, the addition of downsizing process variables reduces the size of the regression coefficient for site and increases the model R^2. Since the site variable carries information about downsizing history (after adjusting for demographics and downsizing process variables), this finding suggests that perceptions of job security are most influenced by the downsizing history of a site and by worker tenure, and somewhat less so by process variables such as fairness, openness, and opportunity.

The results provide partial support for our second hypothesis, which predicted that the site differences would be minimized after controlling for downsizing process variables. While the downsizing process variables do reduce the differences between the high and low downsizing sites, the site differences are still significant in the final regression models. This indicates that the downsizing process variables do not fully moderate the effects of site.

DISCUSSION

This study found significant effects of downsizing/restructuring on worker stress, health, coping, and job security in the two study sites. Site A had undergone a single episode of downsizing in the year before the study, and all the layoffs were voluntary. Site B had undergone multiple episodes of downsizing over a five-year period, and these included involuntary as well as voluntary layoffs. In a downsizing episode at site B that occurred the year before the study, about half of the layoffs were involuntary.

Site B, with a history of more downsizing episodes and involuntary layoffs, had significantly higher mean scores on all dependent and independent variables than site A, which had a single episode of downsizing. These differences remain statistically significant after adjustment for age, sex, race, education, income, and tenure. Regression analyses of each dependent variable separately reveal that downsizing process variables (opportunity and fairness) and site are significant factors in all the final models. In all models except health symptoms, education level also is significant in the final regression models, indicating that employees

Table 4.5

Hierarchical, stepwise multiple regression results

	Step 1 Unadjusted regression coefficient	**Step 2** Adjusted for demographics	**Step 3** Adjusted for demographics + fairness	**Step 4** Adjusted for demographics + fairness + openness	**Step 5** Adjusted for demographics + fairness + openness + opportunity	**Final model** All variables in final regression model (standardized regression coefficients)
Survivor syndrome						Site (.11), race (.06), education (.16),
Coefficient for site	.17	.17	.12	.12	.11	fairness (–.16), opportunity (–.22)
Adjusted model R^2	.03	.06	.12	.12	.16	
Work stress						Site (.09), age (–.10), education (.15),
Coefficient for site	.12	.14	.10	.10	.09	fairness (–.14), opportunity (–.17)
Adjusted model R^2	.02	.05	.09	.09	.11	

Cope						Site (–.08), education (–.06),
Coefficient for site	–.14	–.14	–.10	–.09	–.08	fairness (.13), opportunity (.19)
Adjusted model R^2	.02	.02	.06	.07	.09	
Stress symptoms						Site (.11), sex (–.09), age (–.13),
Coefficient for site	.16	.15	.12	.12	.11	education (.12), tenure (.10),
Adjusted model R^2	.03	.06	.08	.08	.09	fairness (–.10), opportunity (–.13)
Health symptoms						Site (.10), sex (–.14), fairness (–.14),
Coefficient for site	.13	.13	.10	.10	.10	opportunity (–.07)
Adjusted model R^2	.02	.04	.06	.06	.07	
Job security						Site (–.17), race (.06), tenure (.15),
Coefficient for site	–.18	–.23	–.19	–.18	–.17	fairness (.13), openness (.10),
Adjusted model R^2	.03	.05	.11	.12	.14	opportunity (.14)

with more education had higher scores on survivor syndrome, stress symptoms, and perceived job security, and lower scores on coping.

We assessed the relative effects of downsizing history and downsizing process variables by entering the site variable in the first step of each regression model and then examining how its regression coefficient changes as the downsizing process variables are entered. In most cases, the regression coefficient for site becomes lower, but still statistically significant, when fairness, openness, and opportunity are entered into the models. This indicates that the effects of the process variables on stress, health, coping, and job security are significant but do not explain all the variance due to site. Once the effects of demographic and process variables are removed in the regressions, the Site variable reflects downsizing history, so the results indicate that downsizing history per se has important effects on worker stress, health, and job security, regardless of how the downsizing was accomplished.

Our study focused on symptoms, not actual health outcomes. However, a recent study indicates how such symptoms can initiate a chain reaction leading to long-term sickness absence. Kivimaki and colleagues (24) demonstrated that downsizing resulted in changes in work, social relationships, and health-related behaviors, and that these changes contributed to increased rates of long-term sickness absence. For instance, sickness absence was twice as likely in job groups that had experienced major downsizing (>18 percent) as in those with minor downsizing (<8 percent). Moreover, the role of change in work characteristics after downsizing was assessed by adjusting the relationship between downsizing and sickness absence. After adjustment for changes in work characteristics (e.g., demands, control), the relationship between downsizing and sickness absence was reduced by nearly 50 percent.

Parker and colleagues (22) studied the effect of strategic or planned downsizing on employees' job satisfaction and job-related strain. Employees in a company that had introduced planned employment changes were followed over a four-year period. Although measured job demand increased, well-being and job satisfaction did not decrease. The authors concluded that the managed strategic downsizing actually improved employees' sense of control, because of new work characteristics introduced as part of the reorganization. Although our results do not entirely comport with Parker and coworkers' findings, the inclusion of downsizing process variables mitigated the effect of site and hence downsizing on the array of outcome measures.

Potential limitations of the present study include the use of workers from a single industry and reliance on self-report data. However, although both study sites were in the nuclear industry, there were many different contractors and a good range of different occupations within each site. Moreover, the pattern of results and agreement with prior downsizing studies suggest that the findings would generalize well to other industries. We used a cross-sectional design, and statements of causality are not possible with such data. This is not a problem with

the comparisons between high and low downsizing sites, but the direction of causality can be an issue with the regression models. It is noteworthy that longitudinal studies of downsizing and restructuring have produced data that agree with our results (24, 25), and the direction of the causal arrow appears to be unambiguous. Finally, the exclusive use of self-report data, while entirely appropriate for measuring perceived worker stress and well-being, raises concerns about common method variance. Some have suggested that common method variance is not a great problem in this type of research (26), but future studies should balance self-report measures with more objective indicators such as absenteeism records, injury statistics, and the like.

CONCLUSION

The implications of our results for organizations that expect downsizing in the near future are straightforward. Downsizing episodes will be associated with measurable effects on survivors' stress and well-being. In the present study, the differences between high and low downsizing sites became smaller when the downsizing process factors were added to the regression models but site differences were still significant. Having said that, our results also clearly demonstrate that the effects of downsizing on worker stress, health, coping, and job insecurity can be reduced if organizations make efforts to conduct layoffs fairly and with open and honest communication.

Perhaps most importantly, the effects on worker stress and health can be further minimized if the post-downsizing work environment provides new opportunities for creative and interesting work, more worker involvement in decision-making, and more opportunities to learn new skills. This finding agrees with reports by Parker and coauthors (22), Kivimaki and coauthors (24), Preitzer and Mishra (27), and Burke (25) that changes to the work environment after downsizing can have important effects on workers' responses. Positive changes to the work environment after downsizing can reduce employees' negative responses to the downsizing event and can also reduce health and well-being consequences.

There are signs that research on the adverse health effects of downsizing on job survivors may be influencing corporate policies. A recent survey of 572 human resource professionals, conducted by the Society for Human Resource Management, found that most organizations in 2001 took preventive steps before resorting to layoffs (28). The top four pre-layoff steps were attrition (63 percent), hiring freeze (49 percent), not renewing contract workers (21 percent), and encouraging employees to take vacations (20 percent). If these steps are not enough to avoid layoffs, most organizations try to be sensitive to employees' needs. Forty-one percent of organizations said they had one-on-one discussions with employees that included the manager and a human resources representative, and more than half of the organizations indicated that they tried to enhance communication with employees about layoffs.

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