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Physical and Mental Health Effects of Surviving Layoffs:

A Longitudinal Examination

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Abstract

Using longitudinally collected data, we examined mental and physical health outcomes resulting from the type (i.e., none, indirect, or direct) and frequency (once or more than once) of contact workers had with company layoffs. In addition, we also tested the mediating effects of depression and alcohol consumption on the job attitudes – health outcomes relationship. We collected data on two separate occasions (in years 1997 and 1999) from 1244 participants working in varied occupations at a large manufacturing organization. Controlling for all baseline levels of the dependent measures, we found that those participants with direct layoff contact reported significantly worse job attitudes (e.g., role ambiguity, job security) and health outcomes (e.g., alcohol consumption, depression, and work injuries), than those respondents with indirect layoff contact. In turn, workers with indirect layoff contact reported poorer mental and physical health as compared to those without layoff contact. Participants with more than one exposure to indirect layoff contact were only slightly more likely to report health problems than those workers with a single experience. Analyses from structural equation modeling revealed that lower levels of job security and the higher levels of role ambiguity directly led to greater alcohol consumption and higher levels of depression and ultimately to more problems with alcohol, worsening physical health, and more workplace injuries. Limitations of this study, implications of these findings, and suggestions for future research are discussed.

Physical and Mental Health Effects of Surviving Layoffs: A Longitudinal Examination

Introduction

Corporate downsizing has become an ongoing feature of the economic landscape in the United States (Cappelli, Bassi, Katz, Knoke, Osterman, & Useam, 1997). Sizeable numbers of employees have experienced layoffs and a much greater number anticipate layoffs, believing they might lose their jobs in the near future (Ellwood, Blank, Blasi, Kruse, Niskanen, & Lynn-Dyson, 2001). That there tend to be deleterious health consequences for those who are laid off and become unemployed has been fairly well-established by a large body of research (Dooley, Fielding, & Levi, 1996; Kasl, Rodriguez, & Lasch, 1998). Research on the effects of downsizing on the much larger population of layoff survivors (i.e., those who witness the layoffs of coworkers but remain employed) is less well-developed.

Nevertheless, the findings from the studies that have examined the effects of large-scale layoffs on survivors' health consistently find evidence of small yet important adverse health effects. For example, cross-sectional and longitudinal studies report increases in self-reported physical and psychiatric morbidity, including depression (Ferrie, Shipley, Marmot, Stansfield, & Smith, 1998; Grunberg, Moore, & Greenberg, 2001; Hughes, 2000; Woodward, Shannon, Cunningham, McIntosh, Lendrum, Rosenbloom, & Brown, 1999), increases in self-reported neck and back pain (Shannon, Woodward, Cunningham, McIntosh, Lendrum, Brown, & Rosenbloom, 2001), increases in certified sickness absence (Beale & Nethercott, 1988; Vahtera, Kivimaki, & Penti,

1997), and increases in eating and Body Mass Index (Ferrie et al., 1998; Grunberg et al., 2001). Other researchers have noted the tendency of some individuals to turn to mood altering substances in an attempt to cope with such job-related distress (Reissman, Orris, Lacey, & Hartman, 1999).

A few studies have also begun to explore possible causal pathways that might account for the association between surviving downsizing and adverse health outcomes. Not surprisingly, a key pathway is through the heightened job insecurity survivors feel as they anticipate possible additional rounds of layoffs (Ferrie, Shipley, Marmot, Martikainen, Stansfeld, & Smith, 2001; Grunberg et al., 2001; Kivimaki, Vahtera, Pentti, & Ferrie, 2000). There is also some evidence that certain workplace changes that often accompany downsizing, such as increased job demands, mediate the relationship between downsizing and physical (Kivimaki et al., 2000) and mental health (Moyle, 1998). Job demands have also been linked to increased incidents of spinal injury (Krause, Ragland, Fisher, & Syme, 1998) and greater psychological distress and physical health symptoms (Jamal, 1990; Spector, Dwyer, & Jex, 1988). Role ambiguity, another variable associated with downsizing, has also been found to predict physical strain (Reissman et al., 1999) and self-reported negative health symptoms (Mak & Mueller, 2001). Parker, Chmiel, and Wall (1997) noted enhanced well-being among employees surviving layoffs only when increased job demands were accompanied by clear role expectations among employees; job demands alone, absent role ambiguity, did not predict depressive symptoms or physical problems. Although intuitively plausible, current research does not find clear evidence that the reductions in social support and the disruptions to social relationships

that often accompany large-scale layoffs are important linking mechanisms in the downsizing-health relationship (Kivimaki et al., 2000; Ferrie et al., 2001).

Despite the recent progress that has been made in the study of the health effects of downsizing on survivors, we believe there are still gaps in our knowledge that are created by an inadequate appreciation of the complex and multifaceted nature of the downsizing process. Employees in a downsizing organization do not experience the process in a uniform way. There are likely to be considerable variations in the nature and intensity of the contact employees have with downsizing. These may result in different experiences and different attitudinal and behavioral responses among employees. Identifying these differences and understanding where the effects may be most severe may help managers, union officials, and public servants create more carefully targeted ameliorative interventions. This paper will therefore delineate more fully the multifaceted nature of downsizing, especially as it is experienced by surviving employees in an organization. In addition, using longitudinally collected data, this paper will model several of the pathways by which downsizing contact affects the mental and physical health of survivors.

The Multifaceted Nature of Downsizing

Although downsizing and the accompanying layoffs tend to reverberate across the entire organization, the effects on employees are likely to vary depending on the nature and intensity of contact employees have with the downsizing process. At one extreme are employees who work in areas of the organization that have escaped layoffs. Such employees are obviously aware that large-scale layoffs are underway, but have minimal personal contact with layoffs. At the other extreme are employees who will feel

especially vulnerable and under threat because they have been targeted for possible future layoffs. Following the 1988 Worker Notification Act (WARN), companies in the United States are required to give potential candidates for layoffs 60 days advance notice (called "warns") when planning large-scale layoffs or plant closures (Addison, 1994). There is evidence that some companies "overwarn," (Armstrong-Stassen, 2002) sometimes with hundreds or thousand of employees (depending on the size of the company) receiving warn notices but subsequently not losing their jobs (Grunberg et al., 2001). Understandably, such employees tend to feel much more uncertain about their job security.

Beyond personal warn notices, employees may be directly affected by downsizing in other ways, especially when it is accompanied by other forms of restructuring. As companies cut their workforces, they often reallocate employees to different positions and areas in the organization. In the large organization we studied, some of this internal job movement resulted from managerial decisions and some from the union negotiated labor contract that enabled blue-collar workers with seniority in "surplus" positions to "bump" other workers with less seniority out of their positions. Some 10% of the workforce in our study experienced geographical and/or positional job movement as a result of bumping. Such an experience is likely to disrupt social relationships, increase job demands and role ambiguity, and heighten feelings of uncertainty about one's job security.

In between these two extremes of no contact or direct personal contact are employees who have *indirect* but important contact with layoffs. For example, many employees will witness the layoff of close coworkers in their work areas or see close

work friends in other areas of the company laid off. While not directly threatening their own job security, such layoffs are likely to heighten these employees' general sense of uncertainty and anxiety, and, in the case of the layoff of coworkers, may result in their being saddled with increased workloads or a different set of work tasks. Certainly, losing coworkers and close work friends to layoffs may disrupt survivors' work-based social relationships.

In addition to such variations in the type of contact employees have with layoffs, there are likely to be differences among surviving employees in the duration or frequency with which they experience the downsizing process. Longitudinal research suggests that working in a downsizing environment for an extended period of time may take a toll on workers' attitudes, sense of well-being, and physical health. Moyle (1998), for example, found that managerial support, role clarity, and job satisfaction decreased over a year's time, although anxiety and depression showed no changes. Reports of physical health problems were greatest during the middle phase of the study.

Some companies, however, also engage in *repeated* episodes of downsizing either because they are in an industry where there are sizeable cycles in product demand or because their economic circumstances require them to cut costs repeatedly. Thus, beyond any lingering adjustments that may persist beyond a single downsizing event, these employees will have repeated contacts with layoffs. It seems reasonable to expect that such repeated contact with layoffs will result in more negative health effects than experiencing only one contact with layoffs. On the other hand, it is plausible that repeated layoff experiences will have diminishing health effects as employees become inured to the impact of layoffs.

Focus of Present Study

Based on the above discussion, we examined the following three hypotheses in the present study. First, we predicted that surviving employees' work experiences, health, and health-related behaviors will vary according to the kind of contact they have had with layoffs, such that those with closer and more direct contact will show the most pronounced effects. Specifically, we examined the effects of layoff contact on the variables of job security, job demands, role ambiguity, depression, alcohol consumption, changes in eating, increased smoking, alcohol problems, self-reported health problems, and work-related injuries. Next, we explored whether repeated indirect contact with layoffs would result in more deleterious health effects than just one such contact. [1]

Third, using a structural equation model, we investigated both the direct and indirect effects of job security, job demands, and role ambiguity in predicting a number of health outcomes [2] (see Figure 1). Consistent with the literature described previously, we hypothesized that these three work variables would be associated with a number of well-being outcomes including depression, alcohol consumption, alcohol problems, self-reported health problems, and work-related injuries. Although it is plausible that previous as well as current levels of mental health and well-being might influence perceptions of one's job (i.e., a model of reverse causation), Moyle (1998) examined this possibility with longitudinal data collected from workers in a downsizing environment. She determined that the best fit model, both conceptually and empirically, was one that treated job variables exogenously, or as precursors of mental health and well-being.

In addition, we posited that depression and health behaviors -- alcohol consumption being the one health behavior we have included in this model -- would

mediate the relationships between the three job variables and the outcomes of alcohol problems, health problems, and work-related injuries. [3] Increased alcohol consumption as a response to work distress has been reasonably supported in the literature, at least as it manifests itself among those workers who subscribe to an escapist model of drinking (Grunberg, Moore, & Greenberg, 1998). Moreover, alcohol consumption as a precursor to alcohol problems, work injuries, and health problems is well documented, and thus its placement in this model is logical.

Depression, although an important health outcome variable in its own right, is treated here as a form of psychological distress which may precipitate or exacerbate various health conditions (Reissman et al., 1999). Even though we predict that job security, job demands, and role ambiguity will directly impact health, we also suggest that they may operate indirectly, working through one or more types of individual level psychological responses. Feuerstein Berkowitz, and Huang (1999) likewise noted that predictions of well-being are enhanced by including both work-related and individual level psychosocial status variables.

A number of researchers have recognized the importance of depression in predicting self-reported physical health (Sullivan, LaCroix, Russo, & Walker, 2001) and mortality rates (Schultz, Beach, Ives, Martire, Ariyo, & Kop, 2000). Liao, Arvey, Butler, and Nutting (2001) also found a significant zero-order correlation between depression and work injuries, although in a regression equation that used all MMPI clinical scales to predict injuries, depression failed to enter the equation significantly. Regarding the health outcome of alcohol problems, we acknowledge that some researchers have treated it as mediator in predicting depression (Sitharthan, Hough, Sitharthan, & Kavanagh,

2001); however, others have found the opposite relationship. Cammata and Nagoshi (1995), for example, found that depression mediated the relationship between stress and alcohol problems.

Finally we note that previous longitudinal research on layoff survivors' health and well-being has been largely conducted on employees in the public sector in Britain and Finland (e.g., Ferrie et al., 1998, 2001; Kivimaki et al., 2000; Vahtera et al., 1997). Other studies of health outcomes among layoff survivors have also tended to be cross-sectional in nature or dependent on small numbers of employees. This paper examines the complex relationship between diverse layoff experiences and health using longitudinal data collected from employees representing a wide spectrum of the occupational hierarchy and working in a large, private manufacturing firm in the United States. If the hypotheses of this study are confirmed, this research will add to the robustness of the finding of the adverse health effects of layoffs on survivors and increase its generalizability.

Method

Study Site

Data for this study were collected from a division of a very large manufacturing organization located in the western United States. The number of employees over the years of our study (1997 – 2000) fluctuated between 80,000 and 100,00 employees. Both white and blue-collar workers across a wide spectrum of occupational skills and organizational positions -- including managers, professionals, design engineers, lower level clerical workers, and semi-skilled machine operators -- were represented in the organization and in our sample.

With respect to downsizing activity, the company has had a history of layoffs and rehires, corresponding to both the cyclical nature of the industry and attempts by the company to diminish permanently the size of the workforce. In the last decade particularly, the organization had initiated multiple waves of layoffs as well as repeated efforts to change the work process and increase efficiency (e.g., new technology, lean manufacturing, cross-functional teams), thereby creating an even greater state of flux. At the time of the first survey in 1997, the division was at the end of a five-year, predominantly involuntary layoff period during which time some 27% of the workforce had lost their jobs and an additional 13% had received a warn notice that they might lose their jobs. In late 1999, at the time of the second survey, the division was in the middle of another downsizing phase that affected some 20,000 employees. In between the periods of the two surveys, the division hired several thousand new workers as it increased production to compete aggressively for market shares. These large swings in manpower, as one would expect, produced considerable anxiety and uncertainty among the workforce. Worker morale, as revealed in internal company surveys, was also seriously weakened. It is in this context that the two surveys were conducted.

Participants

In 1997 (Time 1) we mailed letters to a random sample of 3500 workers asking them to participate in a longitudinal study examining the effects of workplace restructuring on employee health. Participants were assured that they would be paid $20 for their participation and that their responses would remain confidential. From this mailing, 2279 usable surveys (65% response rate) were returned. In the autumn of 1999 (Time 2), we sent Time 1 participants another letter reminding them of their previous

participation and asked them to complete a second survey. They were again assured of confidentiality and a $20 payment for their participation. Of the 2279 Time 1 respondents, 1960 were still employed with the company; of these 1960, 1244 usable surveys were returned (63% response rate). In this paper, we use the data collected from these 1244 participants.

The demographic characteristics of this final sample closely approximated that of the larger organization. The sample was 78% male with a mean age of 46.01 (SD= 8.21) years, and tenure with the company of 17.21 (SD =8.06) years. Nearly 88% of the sample had at least some post high school education. Our sample was, however, proportionately less blue collar than the company's pool of employees (36% in sample, 50% in entire organization).

Procedure and Materials

As part of a larger study that examined work change, health, and performance, we reviewed the literature and conducted three focus groups and over 50 individual interviews in preparation for writing the Time 1 survey. We also met with union representatives and other company personnel in order to explain our study, to encourage widespread participation, and to reassure workers that our research team was independent from the organization. At Time 2, we followed a similar, although slightly scaled down procedure.

Time 1 and Time 2 surveys were similar in content and consisted of single items and multi-item scales designed to measure several dozen work-related experiences, attitudes, and health outcomes. These measures were comprised of scales found in the literature or developed on the basis of employee interviews and focus groups. The subset

of variables reported in this paper are described below. For ordinal, interval, and ratio level data, scale and item-level descriptive statistics are reported in Table 1; intercorrelations among these variables may be found in Table 2. For categorical data, we report frequencies and percentages in Table 3.

Layoff contact. Participants were asked to respond to a set of four items that asked about their layoff experience. Using a yes or no response format, respondents were asked if in the past 5 years (Time 1) or 2 years (Time 2) they had experienced the following: (a) close friends in the company were laid off, (b) coworkers were laid off, (c) they had received a warn notice of possible layoff, and (d) they had been laid off then rehired. In addition, for Time 2 data only, a single item asked the respondent whether she or he had been "bumped" out of a job at the organization during the past 2 years.

Responses to these items were treated in the following manner. First, for analyses that examined the impact of the type of layoff contact, controlling for Time 1 levels of various dependent measures (Hypothesis 1), we created three groups based on participants' responses to Time 2 downsizing contact. A no layoff contact group consisted of participants who responded "no" to each of the four items. Indirect layoff contact respondents were those who had experienced either a friend or coworker's layoff, but who had not personally received either a warn notice, had been laid off and rehired, nor bumped from their job. The direct layoff contact group consisted of those workers who had received either a warn notice, been laid off and rehired, or been bumped out of their job; they may or may not have reported indirect layoff experience.

In order to conduct several of the analyses directed at examining the effects of repeated layoff experiences (Hypothesis 2), we also created layoff contact groups that

combined responses to the four downsizing questions at each time period. As a first step, we removed all participants who reported any form of direct contact at either time period. We also removed participants who reported no contact at both time periods. Next, we created two groups: (a) those who reported some form of indirect contact at only one time period, (b) those who reported indirect contact at both time periods. Small cell sizes of other potential combinations prohibited analysis of other types of repeated forms of contact.

Job security. Based on the work of Armstrong-Stassen (1993), we measured job security with three items (e.g., "At the present time, how worried are you about your job security at [name of company]?"). Workers indicated their response on a 4 point response format, anchored from extremely worried, to not worried at all (alpha = . 81). Consistent with the other measures, higher scores reflected higher levels of job security.

Role ambiguity. Using a 5 point response format that ranged from 1 (fairly often) to 5 (very rarely), three items measured the degree to which respondents were clear about their job responsibilities and work objectives (Caplan, Cobb, French, Van Harrison, & Pinneau; 1980). Responses were summed such that higher numbers indicated higher levels of role ambiguity (alpha = .88).

Job demands. Respondents indicated the degree to which they (a) have adequate time to complete their work, (b) have too much work to do everything well, and (c) believe that the amount of work they are asked to complete is fair (Cammann, Fichman, Jenkins, & Klesh, 1983). Participants marked their response on a scale anchored from 1 (strongly agree) to 5 (strongly disagree); we then summed these responses such that higher scores reflected greater levels of reported work demands (alpha = .76).

Health behaviors. On both surveys, we asked participants to indicate whether or not they had experienced changes in two health-related behaviors during the previous 12 months. Using a yes or no response format, respondents indicated whether they had (a) changed their eating habits, or (b) increased their cigarette smoking (modified from Moos, Cronkite, Finney & Billings, [1986] and Quinn & Staines, [1977]).

Alcohol consumption. We measured alcohol consumption by asking participants to indicate the number of times in the past 6 months (ranging from never to every day) they had drunk the following amounts of alcohol at a single sitting: (a) 1 or 2 drinks, (b) 3 or 4 drinks, (c) 5 to 7 drinks, (d) 8 or more drinks. By multiplying the frequency times the amount, we converted each of these responses to a number of drinks consumed in the previous six months. We then summed these products to arrive at a total number of drinks consumed in the previous six months.

Depression. We measured depression with a shortened version of the CES-Radloff scale (Mirowsky & Ross, 1989). Using a 8 point scale anchored from never to everyday, participants indicated how often during the last week they had experienced depressive symptoms such as feeling lonely and feeling that they "couldn't shake the blues." Responses to these seven items were summed so that possible scores could ranged from 0 (low depression) to 49 (high depression), (alpha = .87).

Alcohol problems (CAGE). Alcohol problems were assessed by participant's responses to the sum of four items comprising the CAGE scale (Ewing, 1984). Using a yes or no format, the CAGE asks respondents, for example, whether they have felt they ought to cut down on their drinking in the past five years, or if they have felt bad or guilty

about their drinking (alpha = .64). Higher scores reflect a greater number of reported problems.

Physical health problems. Using a yes or no response format, participants indicated whether they had experienced the following health problems: (a) back pain, (b) headaches, (c) heart problems, (d) high blood pressure, (e) ulcers, (f) indigestion (modified from Moos et al., [1986] and Quinn & Staines, [1977]). These items were summed to result in a total score ranging from 0 (no reported health problems) to 6 (high number of health problems).

Work injuries. A single item asked respondents to indicate the number of work-related injuries or illnesses they had experienced during the past year. Participants wrote in the number and filled in the corresponding bubbles to reflect their answers.

Results

We conducted three separate but related analyses to examine the effect of layoff contact on surviving workers. The first analysis involved the impact of the different types of layoff contact, ranked according to the intensity of the contact, on the set of physical and mental health variables. As described above, the independent variable, layoff contact, had three values: no contact, indirect contact, and direct contact. We estimated the three group means for each dependent variable, controlling for the prior level of the dependent variable.

This form of control is the main benefit from our panel design. In effect, an estimate of a Time 2 response variable using the corresponding Time 1 variable as a predictor controls for individual-level heterogeneity. Whatever the explanation, some individuals will have high Time 1 values of, say, depression, while others will have low

levels. Even controlling for a number of other variables, an unexplained difference between these individuals might persist. This is a common scenario with analysis on cross-sectional data. Once we move to longitudinal data from a panel design, however, we no longer face this problem. The fact that some value might be high or low at one point in time is not relevant because we are concerned with explaining the change that occurs from Time 1 to Time 2.

The results of this analysis are presented in Table 4. With respect to every variable, save job demands, there were significant differences between group means, generally following a pattern in which the direct layoff contact group fared worse than the indirect contact group which, in turn, fared worse than the no contact group. This represents strong support for Hypothesis 1. In addition to the response variables examined through the ANCOVA, two binary measures of health-related behaviors, smoking more and eating more or less were analyzed through logistic regressions (not shown in Table 4). While there were no significant differences between the indirect layoff contact group and those with no contact, those with direct contact had significantly higher rates of eating changes (OR = 2.17, 95% CI =[1.39, 3.39], p = .001) and increased smoking (OR = 2.62, 95% CI = [1.18, 5.79], p = .018) than the no contact group, consistent with Hypothesis 1.

The next analysis examined the impact of repeated indirect layoff contact on health, controlling for the Time 1 levels of all job attitude and health measures. This analysis was similar to the first, as it included the same set of response variables and controlled for the Time 1 level of the response variable; however, the layoff contact variable was altered. Using the tripartite division of layoff contact in the previous

analysis and considering the combination of layoff experiences from both Time 1 and Time 2, there were nine possible outcomes (e.g., no contact at Time 1 and no contact at Time 2; no contact at Time 1 and indirect contact at Time 2; etc.) Unfortunately this complete typology could not be used in the statistical analysis because only a small number of respondents fell into most of these nine combinations. Given this constraint, the layoff contact variable was created as explained previously in the method section: Those with no contact at both time periods and those with any direct contact were excluded from the data set. Two groups, those with indirect layoff contact at only one time period and those with indirect layoff contact at both time periods, were created. Thus, this layoff contact variable was essentially a measure of repeated indirect contact.

The results of this analysis are presented in Table 5. We found that repeated indirect contact was associated with reduced feelings of job security and greater levels of depression. No other significant results were present. As with the first analysis, logistic regressions were conducted on eating changes and smoking increases, this time using repeated indirect contact as the predictor along with Time 1 controls. In this case repeated indirect contact did not predict increases in smoking but was marginally related to changes in eating habits (OR = 1.32, 95% CI = [.97, 1.82], p = .08).

The last analysis sought to identify the pathways through which the physical and psychological consequences of layoff contact were related. The causal (structural) model we estimated is presented in Figure 1. For theoretical reasons discussed above, we take job security and role ambiguity to be exogenous, that is, they will affect the others but not be affected by them. [4] Job security and role ambiguity are understood in the model to be causes of alcohol consumption and depression, along with their Time 1 levels. Again, the

inclusion of Time 1 variables in this panel design is a strong form of control for individual level heterogeneity and a provides a means to focus on the change from Time 1 to Time 2. These four variables, job security, role ambiguity, alcohol consumption, and depression, are modeled as causes of the three dependent variables, alcohol problems (CAGE), physical health problems, and workplace injuries (again controlling for the Time 1 values of the dependent variables). [5]

This structural equations model was estimated using AMOS version 4.0, and the results are reported in Table 6. Tracing the impact of job security, we found that it was significantly associated with alcohol consumption and depression. These are the direct effects. Indirectly, job security affected both physical health and workplace injuries through the mediator of depression and also affected alcohol problems through the mediator of alcohol consumption. Turning to role ambiguity, we found that it was directly related to depression but not to alcohol consumption. Like job security, role ambiguity indirectly affected physical health and injuries with depression serving as a mediator.

Considering both the first ANCOVA findings and the SEM, the results of our analyses suggest the following. More personal contact with layoffs (direct vs. indirect vs. none) reduces job security and increases role ambiguity. The lower levels of job security and the higher levels of role ambiguity, following the causal pathways presented in Figure 1, directly lead to greater alcohol consumption and higher levels of depression and ultimately to more problems with alcohol, worsening physical health, and more workplace injuries.

Discussion

This study, while advancing our understanding of the effects of layoffs on survivors' well-being, has a number of limitations. Most obviously, the results are drawn from one large firm and, as such, may not generalize to other companies. There is also the problem that the data are based on self-reports and may be affected by problems of misrepresentation and inaccurate recall. Moreover, the relatively small number of respondents who reported direct contact precluded a full test of the hypothesis that repeated exposures to layoffs are more damaging to well-being than a single exposure. Finally, inadequate measures of some of the concepts prevented us from testing a comprehensive model of the possible causal pathways linking layoffs to well-being, specifically the role of other health related behaviors (besides alcohol consumption) and of possible disruptions to social relationships.

These limitations considered, the results indicate that working in a downsizing environment is experienced differently by those with varying levels of contact with layoffs -- direct, indirect, and none. Although there was no true control group in the sense that all employees were certainly aware of and probably impacted by working in this larger downsizing context, it was the case that those who reported "no contact" fared best of these three groups. Those with the direct contact, as experienced in the forms of warn notices, being bumped, and being laid off then rehired, reported significantly lower levels of job security and higher levels of role ambiguity, alcohol consumption, depression, eating changes, smoking, alcohol problems, physical health problems, and work-related injuries. However, even comparing the indirect to the no contact group, we found significant differences on job security, role ambiguity, and depression.

That job demands failed to show significant differences between the three groups was unexpected. One possible explanation is that job demands may not have been affected during this time of restructuring because of the cyclical nature of the industry; employees may have felt a lighter workload because of a reduction in work orders. Such an explanation, however, seems unlikely based on anecdotal evidence from employees, none of whom mentioned that workloads had been reduced. A more reasonable explanation is that other attitudes toward work, such as role ambiguity and job security may have been more salient to respondents, and, as such, took priority over any changes in work demands.

We did find some evidence that working in a chronic downsizing environment is worse than a single one-time exposure to layoffs. Those with two indirect contacts with layoffs reported significant less job security, greater depression, and more frequent eating changes than those who experienced such contact at only one time period. However, because we removed respondents with no or direct contact for this analysis (for reasons explained earlier), our test does not fully examine the impact of working in a chronic layoff environment. Since layoffs and workplace restructuring are more frequently becoming a permanent feature of the American economy, future investigations should explore more fully the impact of working in this recurrent stressful situation.

Results from the structural equations analysis suggest that the physical and psychological effects of downsizing may be caused, in part, by changes in job security and role ambiguity. Controlling for all baseline levels of the variables in the model, we failed to find that either job security or role ambiguity directly affected physical health, alcohol problems, or workplace-related injuries. Rather, their effects on these outcome

variables were mediated by depression (for both job security and role ambiguity) and alcohol consumption (for job security). This provides some evidence that one response to job insecurity is increased alcohol consumption, which, in turn, may eventually result in alcohol problems. Even though previous research has not always found support for greater levels of work stress to be associated with increased alcohol consumption or problems (Grunberg et al., 1998), it may well be the case that specific types of workplace stressors, such as low levels of job security, prompt this type of response more than others. Interestingly, role ambiguity failed to predict increased alcohol consumption, a finding that might be taken as some modest evidence for this conjecture.

Moreover, depression significantly mediated the relationship between both job attitude variables and the outcome variables of workplace injuries and physical health. As mentioned earlier, we recognize that depression is an important outcome in its own right; moreover, some researchers have modeled depression to both coexist as well as to be predicted by other health problems (Sitharthan et al., 2001). Our analyses provide some evidence, however, that individual affective reactions to workplace stressors may result in health problems and injuries. Whether such mental states make workers more vulnerable to illness, careless on the job site, or more likely to report or perceive illness and injuries cannot be answered with these data. Other affective reactions such as anxiety (Feuerstein et al., 1999) and avoidance of emotional pain (Hughes, 2000) have been indicated in previous studies and may prove to be fruitful avenues in future investigations that attempt to link work-related stressors and health outcomes.

Conclusion

These results, when considered in conjunction with other longitudinal studies, some of which use clinical measures of physical and mental health, provide strong evidence that large-scale layoffs often produce damaging psychological and physical effects on survivors' well-being. This finding, we believe, can be cautiously generalized, both because of the similarity of results obtained by other longitudinal studies conducted in other countries and in other economic sectors (Ferrie et al., 1998; 2001), and also because the firm in this study shares many features with other large manufacturers in the United States.

In addition to confirming that layoffs affect survivors' well-being, we have also sought to identify the causal pathways that link downsizing experiences to mental and physical health. The important role of job insecurity is once again confirmed (Ferrie et al., 2001; Grunberg et al., 2001; Pollard, 2001). Living in a state of uncertainty about one's future job security is a distressful condition with potentially harmful consequences. We have also identified role ambiguity as another important mediator. The turmoil created by large-scale layoffs is likely to produce uncertainty not only about one's job security but also about one's role in the organization as many employees are redeployed and job responsibilities are redefined. More research is clearly needed to identify other possible pathways, including the role played by disruptions to social relationships as well as by changes in a range of health –related coping behaviors such as eating, smoking, and exercising.

The cumulative evidence of studies of survivors' well-being indicate that layoffs have substantial human and social costs. Although many of these will be borne primarily

by individuals and their families, there is some evidence that companies who engage in mass layoffs experience declines in employee morale, commitment, and performance (Cascio, 1993; Johnson, 1996). At a minimum, these findings suggest that companies that engage in mass layoffs should be aware of, and responsive to, the distress experienced by their remaining employees.

Endnotes

1. We could not test whether repeated direct contact with layoffs was worse than one such contact because of insufficient number of respondents who reported direct contact at both time periods. However, we believe it is reasonable to infer that if repeated indirect contact results in worse health outcomes, then so too would repeated direct contact.
2. Although there are grounds for including disruptions to social relationships as a mediator, we did not include adequate measures of this variable in the first two waves of the study. We plan to examine its mediating role after additional waves of panel data are collected.
3. Beyond alcohol consumption, we collected data on changes in eating and smoking. These variables might also be reasonably included in the structural model; however, as binary variables they do not have the appropriate statistical characteristics to be included in the empirical estimation.
4. In principle, job demands fills the same position in the causal model but, since it lacked any empirical relationship with layoff contact based upon the ANCOVA, it was not included in the SEM analysis.
5. Figure 1 portrays the structural aspects of the model. The SEM also includes a measurement component in which the (unobserved) variables presented in Figure 1 are related to specific, observed indicators. These indicators are the same as those discussed in the methodology section. The full description of the indicators

as well as the empirical results of the measurement model are available upon request from the authors.

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Table 1

Scale and Item-level Descriptive Statistics

Variable	Possible Range	Obtained Range	Mean	SD	Coefficient alpha
Job security	3-12	3-12	8.79	2.25	.81
		3-12	7.67	2.63	.88
Role ambiguity	4 -20	4 - 20	8.40	3.16	.88
		4 - 20	8.56	3.33	.90
Job demands	3 –15	3 - 15	9.47	2.67	.78
		3 - 15	9.00	2.65	.75
Alcohol consumption	0-3420	0-2268	100.0	209.9	NA
		0-3420	106.7	227.2	NA
Depression	0-49	0-49	7.3	8.15	.87
		0-49	7.8	8.9	.88
Alcohol problems (CAGE)	0-4	0-4	.45	.84	.64
		0-4	.46	.86	.65
Physical health problems	0-6	0-6	1.76	1.23	.45
		0-6	1.87	1.24	.46
Work injuries	0-99	0-23	.28	1.13	NA
		0-50	.40	2.02	NA

Note. Time 1 results appear in the first row, Time 2 results appear in the second row. In all cases, higher numbers refer to greater levels of the construct.

Table 2

Intercorrelations Among the Measures

	JS	RA	JD	AC	D	CAGE	PHP	WI
Job security (JS)	**.58***	*-.25**	*-.06**	*-.02*	*-.28**	*-.11**	*-.20**	*-.09**
Role ambiguity (RA)	-.19*	**.51***	*.21**	*.01*	*.23**	*.09**	*.07**	*.03*
Job demands (JD)	-.07*	.21*	**.46***	*-.01*	*.21**	*.07**	*.13**	*.04*
Alcohol Consumption (AC)	-.06*	-.02	-.01	**.66***	*.10**	*.47**	*.06*	*-.01*
Depression (D)	-.28*	.23*	.18*	.13*	**.47***	*.17**	*.32**	*.12**
Alcohol Problems (CAGE)	-.04	.01	-.01	.53*	.15*	**.61***	*.11**	*.04*
Physical Health Problems (PHP)	-.16*	.11*	.10*	.07*	.32*	.09*	**.55***	*.10**
Work Injuries (WI)	-.08*	.09*	.10*	.01	.17*	.04	.03	**.06***

Note. * $p < .05$. Time 1 intercorrelations are italicized and located in the upper triangle, Time 2 intercorrelations are located in the lower triangle. The correlations between Time 1 and Time 2 for a given measure are found in bold along the main diagonal.

Table 3

Subgroup Sizes and Percentages (in parentheses) for Categorical Data

Variable	Time 1	Time 2
Layoff contact		
None	123 (9.9)	309 (25.2)
Indirect	945 (76.0)	779 (63.4)
Direct	176 (14.2)	140 (11.4) [a]
Eat change (more or less)		
Yes	439 (35.7)	407 (32.9)
No	791 (64.3)	829 (67.1)
Smoke more		
Yes	97 (8.0)	102 (8.3)
No	1111 (92.0)	1126 (91.7)

Note. Percentages are based on the total number of valid responses obtained for each item for a given data collection wave. Missing data are not greater than 2.5% for any given item. [a] direct contact includes those who had been bumped from their jobs.

Table 4

Group Means and Pairwise Comparisons between Direct, Indirect, and No Layoff Contact Groups

	Direct Contact (1)	Indirect Contact (2)	No Contact (3)	Pairwise Comparisons (1)-(2) (Direct- Ind) (1)-(3) (Direct – No) (2)-(3) (Indirect – No)
Job Security	6.69	7.51	8.55	-0.82*** -1.87*** -1.04***
Role Ambiguity	8.97	8.65	8.24	0.32 0.73** 0.41**
Job Demands	9.18	9.02	8.87	0.47 0.30 0.15
Alcohol Consumption	134.31	106.28	95.03	28.03* 39.28** 11.25
Depression	10.70	7.66	6.51	3.04*** 4.19*** 1.16**
Alcohol Problems (CAGE)	0.64	0.46	0.47	0.18** 0.17** -0.01
Physical Health	2.15	1.85	1.76	0.30*** 0.39*** 0.09
Injuries	0.95	0.34	0.24	0.61*** 0.71*** 0.10

*** $p < .01$ ** $p < .05$ * $p < .10$

Note. Estimated groups averages were computed controlling for Time 1 values of dependent variables.

Table 5

Group Means and Significance Tests between Participants with and without Indirect Repeated Layoff Contact

	Repeated Indirect Contact		
	Yes	No	Difference (Yes-No)
Job Security	7.30	8.32	-1.02***
Role Ambiguity	8.79	8.38	0.41
Job Demands	9.16	8.94	0.22
Alcohol Consumption	97.61	97.91	0.30
Depression	8.30	6.75	1.55***
Alcohol Problems (CAGE)	0.45	0.53	-0.08
Physical Health	1.92	1.83	0.09
Injuries	0.45	0.28	0.16

Note.*** $p < .01$ ** $p < .05$ * $p < .10$. Estimated groups averages were computed controlling for Time 1 values of dependent variables.

Table 6

Structural Equation Modeling Results: Regression Weights and Standard Errors

Dependent Variable Independent Variable	Regression Weight (s.e)	Standardized
Depression		
Depression, time 1	0.492***	0.455
	(0.045)	
Job Security	-0.148***	-0.143
	(0.036)	
Role Ambiguity	0.190***	0.150
	(0.043)	
Alcohol Consumption		
Alcohol Consumption, time 1	0.685***	0.779
	(0.057)	
Job Security	-2.930**	-0.075
	(1.307)	
Role Ambiguity	-1.220	-0.026
	(1.603)	
Bad Health		
Bad Health, time 1	0.446***	0.489
	(0.073)	
Job Security	-0.012	-0.047
	(0.012)	
Role Ambiguity	0.014	0.046
	(0.014)	
Depression	0.075***	0.314
	(0.014)	
Alcohol Consumption	0.000	0.015
	(0.000)	
Drinking Problems (CAGE)		
Drinking Problems, time 1	0.536***	0.554
	(0.044)	
Job Security	0.013	0.033
	(0.012)	
Role Ambiguity	0.009	0.018
	(0.015)	
Depression	0.014	0.038
	(0.012)	
Alcohol Consumption	0.004***	0.418
	(0.001)	
Injuries		
Injuries, time 1	0.146**	0.077
	(0.064)	
Job Security	-0.102	-0.058
	(0.067)	
Role Ambiguity	0.003	0.001
	(0.081)	
Depression	0.125*	0.073
	(0.066)	
Alcohol Consumption	0.000	0.000
	(0.002)	

Note. *** $p < .01$ ** $p < .05$ * $p < .10$

Figure Caption
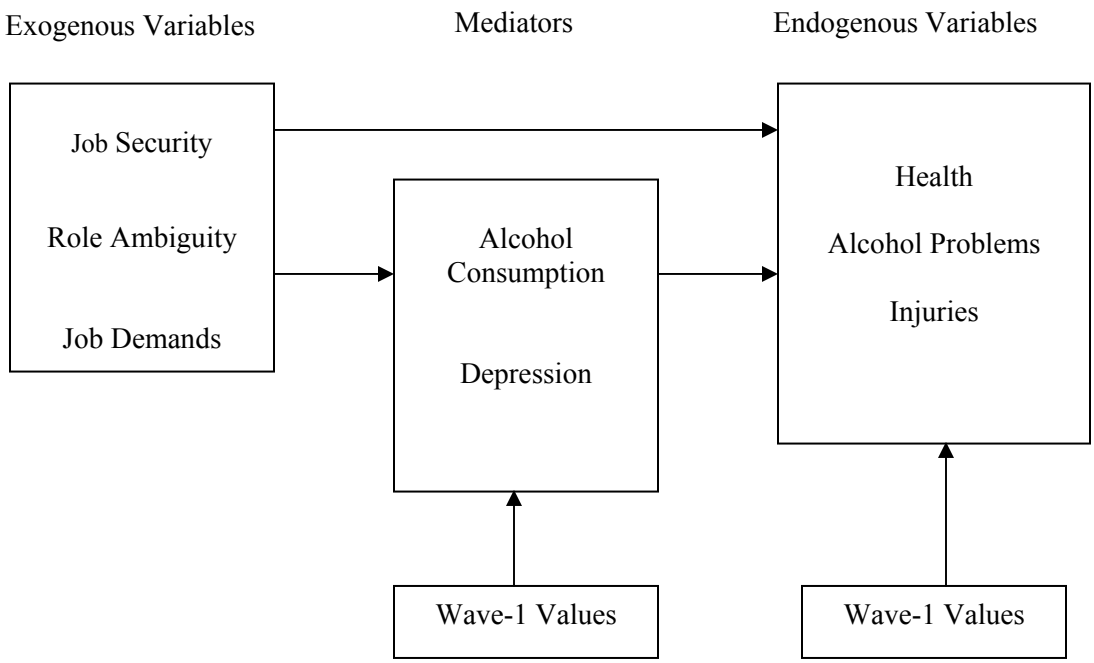
Figure 1. Causal model of layoff-related outcomes.