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Effects of Layoffs and Plant Closings on Depression Among Older Workers

Jennie E. Brand
Becca R. Ley
William T. Gallo

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AMONG OLDER WORKERS***

JENNIE E. BRAND

University of California – Los Angeles

BECCA R. LEVY

Yale University

WILLIAM T. GALLO

Yale University

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* Direct all correspondence to Jennie E. Brand, Department of Sociology, University of California – Los Angeles, 264 Haines Hall, Los Angeles, CA 90095-1551, USA; email: brand@soc.ucla.edu; Tel: 310.266.0826; Fax: 310.206.9838. Jennie E. Brand was supported by an NICHD training grant at the Carolina Population Center, University of North Carolina – Chapel Hill. William T. Gallo was supported by grants from the Claude D. Pepper Older Americans Independence Center at Yale (P30AG21342) and the National Institute on Aging (R01AG027045/K01AG021983). Becca R. Levy was supported by grants from the National Institute on Aging (R37AG17560) and the Donaghue Medical Research Foundation. The ideas expressed herein are those of the authors.

BIOGRAPHICAL NOTE FOR FIRST AUTHOR

JENNIE E. BRAND

Jennie E. Brand is Assistant Professor of Sociology and a faculty affiliate at the California Center for Population Research at the University of California – Los Angeles. Her research focuses on the effects of and relationship between social background, educational attainment, and labor market process and job conditions on socioeconomic attainment and well-being over the life course. She also studies the application and innovation of quantitative methods for longitudinal data analysis. Current research projects include evaluation of heterogeneity in the effects of early schooling, programs to assist disadvantaged students, and college completion on socioeconomic outcomes and the effects of employment insecurity, job loss, and job conditions on health and well-being.

EFFECTS OF LAYOFFS AND PLANT CLOSINGS ON DEPRESSION AMONG OLDER WORKERS

ABSTRACT

Job displacement is widely considered a negative life event associated with subsequent economic decline and depression as established by numerous prior studies. However, little is known about whether the type of job displacement (i.e. layoffs versus plant closings) differentially affects depression and whether gender modifies these effects. We assess the effects of different ways in which a worker is displaced on subsequent depression among U.S. men and women nearing retirement. We hypothesize that layoffs should be associated with larger effects on depression than plant closings, particularly among men due to different social roles. Our findings generally support our hypotheses. We find that men have significant increases in depression as a result of layoffs, while women have significant increases in depression as a result of plant closings.

Key words: job displacement; layoff; plant closing; depression; Health and Retirement Study.

EFFECTS OF LAYOFFS AND PLANT CLOSINGS ON DEPRESSION AMONG OLDER WORKERS

Recent periods of economic reorganization in the U.S. have been associated with increasingly widespread job insecurity and waves of job displacement (Farley 1996; Kalleberg 2000; Levy 1995; Wetzel 1995). Defined as involuntary job loss resulting from a layoff or plant closing, job displacement is associated with significant periods of non-employment and declines in subsequent earnings and job quality (Brand 2006; Fallick 1996; Farber 2005; Hammermesh 1989; Jacobson, LaLonde, and Sullivan 1993; Kletzer 1998; Podgursky and Swaim 1987; Ruhm 1991; Stevens 1997). An extensive body of research also links job displacement to increases in subsequent levels of depression (Burgard, Brand, and House 2007; Dooley, Fielding, and Levi 1996; Gallo et al. 2000; Gallo et al. 2006; Kasl and Jones 2000; Kessler, Turner, and House 1988, 1989; Turner 1995; Warr and Jackson 1985).

Job disruptions among older workers may be particularly damaging, as late-career employment transitions are less common and older workers are more likely to have accumulated non-transferable firm- and/or industry-specific skills, wages, and benefits, leading to poor reemployment prospects and substantial economic hardship (Dooley and Catalano 1999; Farber 2005; Kessler, Turner, and House 1988, 1989; Price, Choi, and Vinokur 2002). Older workers' share of job displacements has also grown in recent decades, and there is evidence to suggest that the incidence and resulting negative economic and psychological effects of job displacement have been increasing among older workers (Couch 1998; Chan and Stevens 2001; Gallo et al. 2000; Gallo et al. 2006).

Several studies (Gibbons and Katz 1991; Hu and Tabor 2005; Stevens 1997) have explored differences in the economic effects of different forms of job displacement. These

studies assess whether post-displacement unemployment duration and earnings penalties vary according to whether workers were displaced via layoff/downsizing, which affect only a portion of workers in a firm, or by plant closing, in which all workers lose their jobs. Less is known, however, about differences in the effects of different forms of job displacement on depression, particularly among older workers. In fact, just one study of which we are aware (Miller and Hoppe 1994) has explicitly studied the form of job loss in relation to depressive symptoms and this study was conducted with a homogenous sample without mental health information collected before the job loss. The objective of this research is therefore to assess whether the particular form of job displacement—layoff or plant closing—is associated with differences in its effect on depressive symptoms in a heterogeneous national sample with prospective mental health information.

The remainder of this paper is organized as follows. First, we present the literature on the effects of job displacement on relevant outcomes, including a discussion of differential effects by gender and by the mode of displacement. Second, we provide theoretical bases for expecting differences in the effects of displacement on subsequent depression and present our hypotheses. Third, we introduce our data, offer some descriptive statistics, and discuss our estimation method. Fourth, we present the results of our analyses for the whole sample and stratified by gender. Finally, we comment on our findings and discuss some implications of our research.

RESEARCH ON THE EFFECTS OF JOB DISPLACEMENT

Job displacement is a negative, often unpredictable life event that threatens people's economic, psychosocial, and somatic well-being (Jahoda 1982; Pearlin et al. 1981; Thoits 1995; Gallo et al. 2006a). Many studies have linked job displacement to downward socioeconomic

mobility and psychological distress (Burgard, Brand, and House 2007; Dooley and Catalano 1999; Dooley, Catalano, and Wilson 1994; Dooley, Fielding, and Levi 1996; Gallo et al. 2000; Gallo et al. 2006b; Kessler, Turner, and House 1988, 1989; Leana and Feldman 1992; Pearlin et al. 1981; Turner 1995; Warr and Jackson 1985). Most estimates indicate that the average displaced worker experiences a substantial period of non-employment (Brand 2004; Fallick 1996; Farber 2005; Kletzer 1998; Podgursky and Swaim 1987; Ruhm 1991; Topel 1990); however, the length of non-employment has a high degree of variance (Seitchik 1991). Displaced workers also suffer substantial earnings losses, which are generally more persistent than non-employment effects of displacement. Earnings losses for displaced workers have been estimated to be between 10 and 25%, with wage scarring observed as long as ten years after the displacement event occurs (Brand 2004; Chan and Stevens 2001; Couch 1998; Farber 2005; Fallick 1996; Jacobson, LaLonde, and Sullivan 1993; Kletzer 1998; Podgursky and Swaim 1987; Ruhm 1991; Seitchik 1991; Topel 1990). As is true for non-employment effects, the degree to which displaced workers suffer earnings and wage losses is cyclical (Kletzer 1991; Topel 1990) and has a high degree of variance (Seitchik 1991).

Beyond economic losses, displaced workers may find that, when reemployed, their jobs are of lower quality in comparison to both the jobs they lost and the jobs held by their non-displaced counterparts (Brand 2006). Some evidence suggests that many displaced workers in their late 50s and early 60s opt for early retirement rather than take on new jobs of lower quality (Farber 2005). They may also face age discrimination when they look for a new job (McCann and Giles 2002). Workers forced into early retirement may be inadequately prepared to meet their retirement consumption needs (Bernheim 1997; Bernheim et al. 2000).

Job displacement typically entails a sequence of stressful experiences, from notification, anticipation, dismissal, and unemployment, to job search, re-training and eventual reemployment. Movement into unemployment is associated with assorted economic pressures, including reduced income, loss of health and pension benefits, and interruption of asset accrual. Loss of employment may also translate to restriction of socially-supportive collegial relationships, new patterns of interaction with family members, and personal assessment in relation to individual values and societal pressures (Pearlin et al. 1981).

Both economic and affective consequences of displacement have been shown to vary by gender. Women generally experience longer spells of post-displacement unemployment than men (Podgursky and Swaim 1987), and married women, in particular, are less likely to return to work (Chan and Stevens 2001). In a study of a single plant closing, Broman et al. (1995) found that unemployment has a larger negative effect on depression for men than for women.

Different Effects by Forms of Job Displacement

Research suggests that the form of displacement produces differential economic consequences. The seminal work in this area (Gibbons and Katz 1991) demonstrated that layoffs are associated with higher economic losses than are plant closings. Gibbons and Katz (1991) argued that in the case of a layoff, discretionary dismissal of employees acts as a signal of below-average productivity, stigmatizing laid-off workers as “lemons.” The market’s inference of this signal affects hiring and wage-setting decisions in the new firms, ultimately resulting in substantial nonemployment and earnings losses. On the contrary, a plant closing, which typically arises from organizational restructuring and in which all workers are terminated without

discretion, does not carry a comparable performance signal. Employment and earnings penalties for workers displaced in this manner are therefore, on average, less severe.

Stevens (1997) also finds larger wage losses for workers displaced by layoffs than for those displaced by plant closings. Her understanding of this result is, nonetheless, somewhat of a departure from Gibbons and Katz (1991). Stevens proposes that the relative difference between the two groups has more to do with pre-displacement conditions than with earnings after separation. In other words, Stevens argues that it is not that laid-off workers have relatively lower post-displacement wages, but rather that they have higher wages prior to separation than workers displaced by plant closings.

The literature on the non-economic consequences of the nature of job termination is sparse. In an examination of the effect of earnings shocks on marital durability, Charles and Stephens (2004) consider differences in the mode of displacement on subsequent risk of divorce, reporting increased likelihood of divorce following a layoff, but not plant closing. With reasoning similar to the Gibbons and Katz (1991) lemon explanation, the authors attribute the higher risk of marital dissolution to the spouse's negative inference about the worker's personal role in the layoff. They maintain that the discretionary nature of the termination conveys to the spouse certain qualities of the displaced worker—principally, traits related to temperament and discipline—which may suggest a lack of marital fitness. This information is used by the spouse in the decision to dissolve the marriage (Charles and Stephens 2004). Although not proposed by the authors, it could also be that displaced workers experience depressive symptoms which, in turn, negatively affect marriage.

There is only a small set of studies on the psychological consequences of the nature of job termination. Miller and Hoppe (1994), in perhaps the most comparable investigation to ours,

report higher anxiety and depressive symptoms among workers who were fired than among those whose positions were eliminated. (In contrast to our terminology, they use “laid off” to describe this latter group.) Ascribing their findings to greater internal attribution on the part of fired workers, the authors suggest that interpretation of the reason for termination is a pivotal intervening influence in the association between dismissal mode and emotional ill health. There are nonetheless numerous limitations to this report that restrict its generalizability. The study population was homogeneous (married, working-class men), selected from a small geographic area (San Antonio, Texas), and observed only after job loss, so that pre-separation measures of psychological distress could not be controlled. Kessler, Turner, and House (1987, 1988) compared workers who indicated that they contributed to their termination (potentially similar to laid-off workers) with that of unemployed workers who attributed the termination to external conditions (potentially similar to workers displaced in plant closings) and, in contrast to Miller and Hoppe (1994), find no significant differences between the two groups’ post-job loss psychological distress. Kessler, Turner, and House (1987, 1988) did not, however, examine whether gender modifies displacement experiences.

THEORETICAL MODEL AND HYPOTHESES

We propose that of the two modes of job displacement considered in this study, layoffs will generally be associated with higher depressive symptoms than plant closings. We expect that this will be so for two principal reasons. First, there is a compelling personal aspect to a layoff that is not common to plant closings. In the case of layoffs, employees are selected for termination based on inadequate job execution or character deficits. Laid-off workers, thus recognizing that individual performance or personal deficiencies merited their dismissal,

attribute the job loss to these shortcomings, which may lead to compromised self-esteem, anxiety, and depression (Leanna and Feldman 1992; Miller and Hoppe 1994). This scenario contrasts with that of plant closings, in which external influences, such as the health of the macro economy or management's decision to restructure or relocate business units, provokes separation. As these factors are beyond the control of individual employees, workers displaced via mass dismissal seldom perceive themselves as responsible for the job loss, and therefore experience less psychological distress.

Second, we believe that layoffs can serve as a negative signal to society of a worker's incompetence, inferior ability, or poor character (Charles and Stephens 1997; Gibbons and Katz 1991; Hu and Tabor 1995; Weiss 1995). The stigma of the layoff may produce direct psychological distress, through strained relations either with colleagues whose jobs have been preserved or with family members (Charles and Stephens 1997; Miller and Hoppe 1994). A more indirect effect of the layoff signal is, however, also possible. If potential employers interpret the layoff as an indication of ineptitude, hiring will be discouraged. The resulting difficulty of laid-off workers to secure suitable employment in a reasonable period may therefore bring about increases in depression. Plant closings, on the other hand, do not involve a negative signal that raises transactions costs for displaced workers. Thus, workers displaced in plant closings will generally experience lower levels of psychological ill health.

Despite our general assertion that post-displacement depressive symptoms will be higher for laid-off workers than for those terminated in business closings, we believe that this pattern may not hold for all groups. In particular, we expect that the psychological impact of displacement type will vary by gender. We presume that divergence in the economic roles of men and women (Bianchi 1995; Bird and Rieker 1999), especially among the cohort of workers

represented by the HRS, will mean that layoffs will be a more harmful form of displacement for men than for women. Our reasoning is that the layoff's implication of personal incompetence is more psychologically detrimental to men who, in this age cohort, are assumed to have a more durable commitment to work role, a stronger attachment to the labor force, and greater psychosocial needs for reemployment than women.

Our hypotheses encompass heterogeneity of gender in assessing the effect of job displacement mode on depression. To restate: We hypothesize that workers who lose jobs as a result of layoffs will have higher post-displacement depression than workers dismissed via plant closings. We nonetheless acknowledge that differences across subgroups may dilute this general effect. We further expect that the negative psychological impact of layoffs will be greater for men than for women, owing to variation in identity and labor force attachment between the sexes.

DATA, DESCRIPTIVE STATISTICS, AND METHOD

Data

We use longitudinal data from the Health and Retirement Study (HRS), a national study of men and women age 50 or older, begun in 1992 and designed to investigate health and economic consequences of older individuals as they advance from work to retirement. Earlier research using data from the HRS has documented a significant association between job displacement and subsequent depression (Gallo et al. 2000; Gallo et al. 2006). At baseline, HRS participants included 12,652 individuals from 7,702 households (response rate = 82%). Baseline surveys were conducted in 1992, via face-to-face interviews. Follow-up interviews, completed

every 2 years, were completed by telephone or mail. Blacks, Hispanics, and Florida residents were over-sampled.

We restrict our sample to HRS participants who, in 1992, were between ages 51 and 61, were working for pay, and had at least one follow-up response. We use data from the first four HRS waves (1992-98) so that study sample members do not exceed 67 years of age at the final data wave analyzed ($n = 4,692$). The sample thus comprises individuals who are assumed to have sufficient attachment to the labor force, and are therefore at risk for declines in mental well-being following job displacement.

Variable Measurement and Descriptive Statistics

Our primary explanatory variable, job displacement type, is represented by two binary indicators, one indicating the loss of a job due to a layoff and another indicating the loss of a job due to a business (plant) closing, retrospectively reported at a given follow-up wave. The referent category is the non-displaced. A total of 203 men (9.4%) and 189 women (8.3%) experienced one or more layoff events and 107 men (4.9%) and 130 women (5.7%) experienced one or more plant closing events over the period 1992-98.

The study outcome is depression, based on 8 items from the 20-item Center for Epidemiological Studies Depression scale (CES-D).¹ The 8 CES-D items, which refer to presence of the symptom in the last week, are: [respondent] felt depressed; felt everything s/he did was an effort; experienced restless sleep; could not get going; felt lonely; felt sad; enjoyed life; was happy. The outcome measure is an index that represents a count of the number of depressive symptoms (range: 0-8; higher values indicate worse mental health). It was created by

¹ Baseline depression is measured equivalently.

first reverse coding responses to the positively-phrased statements (i.e., the final two items), next dichotomizing responses to all 8 items (the symptom was experienced “much,” “most,” or “all” of the time versus “little” or “none” of the time), and finally summing the transformed (dichotomized) variables. Adjusted reliability coefficients for the eight-item depression measure were 0.68 in 1992, 0.81 in 1994, 0.78 in 1996, and 0.77 in 1998.

The risk of job displacement varies along a number of dimensions that, in turn, condition the extent to which displacement may influence subsequent depression. Table 1 describes several such variables by gender and displacement status.² Comparing displaced and non-displaced workers, we find that displaced men and women have on average less education, less job tenure, and are less likely to be retired. Displaced men and women are somewhat less physically healthy and have higher levels of baseline depression. They are less likely to be working post-displacement, and have higher levels of post-displacement depression. Men and women displaced as a result of plant closings have less education, have higher pre-displacement job tenure, and are less likely to find reemployment post-displacement than men and women displaced as a result of layoffs. Despite these similarities among men and women across form of displacement, men displaced as a result of layoffs have lower pre-displacement depression and higher post-displacement depression than men displaced as a result of plant closings, while women displaced as a result of layoffs have *higher* pre-displacement depression and *lower* post-displacement depression than women displaced as a result of plant closings. In addition, men displaced as a result of layoffs have worse pre-displacement physical health than men displaced

² Gallo has tried various weights in previous HRS studies, including an analysis weight, simple household clustering, a combination of the two, and analysis weights adjusted for attrition. Overwhelmingly, the evidence suggests that they do little or nothing to the standard errors. Therefore, we do not include weights in any of our analyses. However, we do control for race, and in some analyses stratify models by race.

as a result of plant closings, while women displaced as a result of layoffs have better pre-displacement physical health than women displaced as a result of plant closings.

--- TABLE 1 ABOUT HERE ---

Statistical Approach and Empirical Strategy

We estimate a series of nested models to assess the effects of layoffs and plant closings on subsequent levels of depression. The first set of models pertains to the entire sample and the second set of models is stratified by gender. The first model in each set only includes indicators of mode of displacement and baseline depression. Since it has been established that people in worse mental health are at greater risk for selection into unemployment (Dooley, Fielding, and Levi 1996), we include baseline depression in all of our models. The second model in each set further controls for race, education, marital status, white-collar occupation at wave one, employer tenure, fulltime employment status, self-reported overall health, and number of health conditions. The measurement of most of these variables is straightforward.³ A third model in each set further controls for a mediating variable: post-displacement reemployment. The influence of reemployment has been widely studied in the literature on the relationship between job loss and depression, with most studies suggesting a protective effect of securing economically and psychologically satisfactory new positions (Dooley and Catalano 1999; Kessler, Turner, and House 1988, 1989; Gallo et al. 2000; Warr and Jackson 1985). The evaluation of reemployment's mediating impact is particularly important in this study, as we

³ One variable that deserves additional explanation is the number of health conditions, which ranges from 0-7, and is based on respondents' reporting ever having had diabetes, cancer, lung disease, heart problems, stroke, high blood pressure, or arthritis.

anticipate that variation in the effect of displacement mode on depression may operate through post-displacement employment trajectories.

We transform our data to person-spells and, as we restrict to the first four spells, we construct up to three person-spell records per HRS respondent. We use Generalized Estimating Equations (GEE), an extension of generalized linear models for the analysis of longitudinal data (Liang and Zeger 1986), to assess changes in depression up to 2 years after job displacement. When data are collected on the same subjects across successive points in time, these repeated observations are correlated over time. If this within-subject correlation is not corrected, then the standard errors of the parameter estimates will not be valid and erroneous inference may result. GEE adjusts for this within-subject correlation, producing consistent estimates of regression parameters and of their variance.

RESULTS

We report results for the full sample in Table 2. Model 1 estimates the effects of layoffs and plant closings on depression, controlling only for baseline depression. This test of differences is performed to introduce basic patterns in the data and provide a benchmark against which to evaluate changes that occur as a result of controlling for observed factors influencing the observed association. We find that workers who are laid off have significantly higher depression scores than workers who are not displaced ($\beta = 0.199$; $p < .01$); the same is true of workers displaced in plant closings, however, contrary to expectations, the magnitude of the displacement effect is larger for this group than for the laid-off workers ($\beta = 0.299$; $p < .01$). Pre-displacement depression has a large and highly significant effect on post-displacement depression.

Model 2 controls for several pre-displacement covariates that may influence the observed associations reported in Model 1. We continue to find significant effects of layoffs and plant closings on depression, although the sizes of the coefficients are reduced by about five percent. Coefficients continue to suggest that plant closings are more harmful to workers' depression than layoffs. Other coefficients work in expected directions: being male, white, educated, married, white-collar, with more job tenure and less physical health problems is associated with lower levels of depression.

--- TABLE 2 ABOUT HERE ---

Our final model in Table 2, Model 3, additionally controls for post-displacement non-employment status. The purpose of adding this variable is to examine the degree to which variation in the effect of displacement form on depression is the result of differences in opportunities to secure reemployment across displacement type. The results indicate that a portion of the effect of losing a job is reduced with the addition of the reemployment control, but that the pattern of results remains unchanged. Post-displacement non-employment reduces the effect of a layoff by about thirty percent, to a level of marginal significance, and reduces the effect of a plant closing on depression by about fifteen percent.⁴

Results by Gender

We report results stratified by gender in Table 3. Like Model 1 in Table 2, Model 4 (for men) and Model 7 (for women) estimate the effects of layoffs and plant closings on depression, controlling only for baseline depression. We find an opposite pattern of results among men and

⁴ We did not find a significant interaction between layoff or plant closing and non-employment status on depression, and therefore did not include these terms in our models.

women that offer insight into the results presented in Table 2. Considering the sub-sample of male workers, we find that displaced men who are laid off have significantly higher depression scores than are men who are not displaced ($p < .01$). This is not the case for men who lose jobs as a result of plant closings. Among women, the reverse is true: we find that women who lose jobs as a result of plant closings have higher depression scores than women who are not displaced ($p < .05$), whereas we do not find a similar effect for women who lose jobs as a result of layoffs. Pre-displacement depression has a large and highly significant effect on post-displacement depression that appears to be roughly equivalent for men and women. Women have higher levels of depression, as indicated by the model constant.

Model 5 for men and Model 8 for women control for pre-displacement covariates. We continue to find a significant effect of layoffs on depression for men ($p < .01$), although the size of the coefficient is reduced by about ten percent; we note a marginally significant effect of a plant closing on depression for women ($p < .10$), reduced in magnitude by about twenty percent. Other coefficients work in expected directions: education, marriage, employment tenure, and health are protective for both men and for women. Moreover, white race and white-collar employment are additionally protective for women.

--- TABLE 3 ABOUT HERE ---

We display mean predicted values by sex in Figure 1. Here we see clearly that women have higher levels of depression in each category (no job loss, job loss by layoff, and job loss by plant closing). For both men and women, workers who do not experience job loss have lower levels of depression than observationally equivalent workers who do lose jobs. However, whereas there are higher levels of depression among men who lose jobs as a result of layoffs than among men who lose jobs as a result of plant closings, there are higher levels of depression

among women who lose jobs as a result of plant closings than among women who lose jobs as a result of layoffs.

--- FIGURE 1 ABOUT HERE ---

Our final models in Table 3, Model 6 for men and Model 9 for women, additionally control for post-displacement non-employment status. Again, the results indicate that a substantial portion of the effect of losing a job is reduced with the addition of the reemployment control, but that the pattern of results remains unchanged. Post-displacement non-employment reduces the effect of a layoff by about twenty-five percent among men; the effect of a plant closing on depression among women is also reduced by about ten percent.⁵

DISCUSSION

In recent decades, the proportion of U.S. job displacements corresponding to older workers has grown, a trend which has encouraged interest in exploring the health effects of unemployment among individuals nearing retirement. Several prior studies have investigated depressive symptoms in relation to late-career job loss; findings from these studies suggest that late-career job displacement is an influential negative life event accompanied by substantial emotional stress and consequent reductions in affective health. Nonetheless, the earlier research did not establish whether the form of displacement—plant closing or layoff—differentially determines the previously reported outcomes. The answer to this question is relevant to accurately directing intervention resources after job loss.

⁵ As for the combined sample, we did not find significant interactions between layoff or plant closing and non-employment status on depression for men or for women, and therefore did not include these terms in our models.

This study examined differences in the effect of job displacement on depressive symptoms by displacement form. We hypothesized that layoffs would be associated with larger effects on depression than plant closings. The foundation of our argument is that the discretionary character of a layoff would provoke self-attribution of the dismissal and instigate a negative market signal that could impede reemployment, both of which could conceivably bring about depression. We also theorized that gender differences in work role and labor force attachment would translate to intensified effects of layoffs for older men.

Contrary to our primary hypothesis, we found that plant closings are associated with a more prominent effect on depressive symptoms than layoffs. Nevertheless, this finding obscures important information that is revealed by our separate analysis of the gender subsamples. As hypothesized, we found that men have a significant increase in depression resulting from layoffs. This result is consistent with the conclusions of Miller and Hoppe (1994), who reported higher depression among men who were selected for termination than among those whose jobs were eliminated. Among women, however, we observed a significant increase in depression associated with plant closings. Because the magnitude of this association is greater than that of the layoff-depression estimate for men, the effect observed for the full sample appears to suggest that plant closings are more detrimental than layoffs.

The descriptive statistics (Table 1) offer some insight into why plant closings, as opposed to layoffs, may be acutely harmful to the emotional well-being of women. Among workers displaced in plant closings, a higher proportion of women (22.9 percent) than men (14.7 percent) are non-white. For non-whites, while layoffs may imply employment with more race-discriminatory firms, plant closings carry no such suggestion (Hu and Tabor 2005). The closing of firms that are assumed to be less- or non-discriminatory in hiring and retention could therefore

have large adverse consequences for the mental well-being of minority workers. Post-displacement earnings outcomes may also act as a mediator. That is, a portion of the increase in women's depression after plant closing may be due to difficulty in securing suitable reemployment, a problem that is more prevalent for non-whites than comparable whites. Despite the descriptive data's suggestion that women displaced by plant closings are more likely than men to be reemployed (48.6 percent for women versus 40.5 percent for men), information about the quality of the new jobs is largely unknown. However, if post-displacement earnings and job quality norms apply to our sample, it is conceivable that earnings effects will be considerable. Research suggests that, among the gender/race strata, black women (roughly 84 percent of our non-white workers are black) experience the largest economic losses in their new positions (Spalter-Roth and Deitch 1999).

There are several noteworthy advantages of this study. First, we use a national sample to analyze differences in displacement mode among older workers. Previous research on this topic was limited primarily to small geographic areas and/or demographically narrow samples. Second, the longitudinal structure of our study enabled us to control for pre-displacement measures of depression, strengthening our ability to infer that the observed effects are causal. And third, the large sample and relatively long follow-up provided an adequate number of observations to analyze males and females separately. The relevance of this gender-stratified analysis is reflected in our results, which suggest important differences in the effect of displacement mode by sex that would not be apparent with a smaller sample or fewer displacement events.

A number of limitations also deserve mention. Our sample in this study was restricted to older workers. This means that, despite the importance of this group as a vulnerable population,

we cannot draw inferences on the mental health effects of displacement mode for workers whose ages fall outside of the range considered. In addition, although the analytic sample is sizeable, it is not sufficiently large to analyze the stratum of non-whites separately. (The gender/race subsamples do not contain enough displacement events to perform inferential statistical testing.) This constraint leaves us to speculate on the possible contribution of race to the plant closing finding among women. Also, our measure of reemployment, which is a critical factor in the displacement-depression relationship, is somewhat crude. Although it is implicitly defined by job search effort, unemployment duration, and other aspects relevant to finding a new position, it is probably not fully capturing the impacts of these individual items.

This investigation augments the existing research on job displacement by providing evidence for considering the mode of displacement in future studies that examine mental health effects. Its findings demonstrate that the mode of job displacement translates to differences in changes in depressive symptomatology, and that these differences vary by gender. Recognizing these patterns will aid in designing and directing appropriate policies and services to address the psychological needs of displaced older workers.

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Table 1. Descriptive Statistics of Independent Variables: HRS

Variables	Men			Women		
	Job Loss, Layoff	Job Loss, Plant Closing	No Job Loss	Job Loss, Layoff	Job Loss, Plant Closing	No Job Loss
<i>Independent Variables</i>						
Non-White	12.7%	14.7%	15.4%	24.1%	22.9%	22.4%
High School or More	76.7%	80.2%	80.0%	83.8%	71.5%	81.1%
Some College or More	43.6%	31.9%	44.0%	39.8%	22.9%	40.1%
Married/Partnered	83.9%	83.6%	86.0%	62.0%	72.2%	63.7%
White-Collar Worker	50.8%	53.4%	56.5%	88.9%	77.8%	88.6%
Employer Tenure	7.62 (10.28)	10.07 (11.22)	13.37 (12.46)	5.32 (8.13)	6.28 (9.07)	8.80 (10.19)
Fulltime Worker	76.7%	77.6%	80.3%	62.0%	61.8%	65.0%
Physical Health, Exc/VG	53.4%	56.0%	57.6%	52.8%	47.9%	57.4%
Number of Health Conditions	1.114 (1.06)	0.793 (0.81)	1.015 (1.01)	1.204 (1.19)	1.083 (1.06)	1.114 (1.06)
Depression (Baseline)	0.869 (1.59)	0.983 (1.53)	0.737 (1.34)	1.176 (1.80)	1.160 (1.75)	0.977 (1.65)
<i>Mediating Variable</i>						
Post-Loss Unemployment	52.1%	40.5%	20.7%	57.4%	48.6%	23.3%
<i>Dependent Variable</i>						
Depression	1.377 (1.90)	1.310 (1.84)	0.960 (1.54)	1.486 (2.08)	1.777 (2.30)	1.264 (1.86)
<i>Number of obs.</i>	236	116	5414	216	144	5955

Notes: Numbers in parentheses are standard deviations.

Table 2. Effects of Layoffs and Plant Closings on Depression, GEE Models

	Model 1	Model 2	Model 3
Layoff	0.199 ** (2.67)	0.191 * (2.49)	0.132 † (1.72)
Plant Closing	0.299 ** (2.66)	0.279 * (2.48)	0.239 * (2.13)
Depression (Baseline)	0.750 *** (59.60)	0.560 *** (37.92)	0.542 *** (36.39)
Sex		0.142 *** (4.99)	0.145 *** (5.04)
Non-White	---	0.089 * (2.50)	0.097 ** (2.66)
High School or More	---	-0.257 *** (6.18)	-0.259 *** (6.16)
Some College or More	---	-0.123 *** (4.44)	-0.128 ** (4.54)
Married/Partnered	---	-0.130 *** (3.96)	-0.135 *** (4.04)
White-Collar Occupation	---	-0.092 ** (2.62)	-0.088 * (2.48)
Employer Tenure	---	-0.006 *** (4.95)	-0.007 *** (5.50)
Fulltime Worker	---	0.157 *** (4.24)	0.230 *** (5.73)
Physical Health	---	-0.264 *** (8.44)	-0.259 *** (8.20)
Num. Health Conditions	---	0.102 *** (6.95)	0.100 *** (6.69)
Post-Loss Nonemployment	---	---	0.194 *** (5.18)
Spell	-0.039 * (2.30)	0.004 (0.26)	-0.002 (0.13)
Constant	0.546 *** (15.73)	0.957 *** (13.21)	0.898 *** (12.28)
Wald χ^2	3601.75	3067.84	2953.09
<i>Number of Observations</i>	12081	12081	12081
<i>Number of Groups</i>	4471	4471	4471

Notes: Numbers in parentheses are t-ratios.

†p<.10 *p<.05 **p<.01 ***p<.001 (two-tailed tests)

Table 3. Effects of Layoffs and Plant Closings on Depression, GEE Models: By Sex

	Men			Women		
	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Layoff	0.310 ** (3.25)	0.284 ** (2.79)	0.213 * (2.09)	0.097 (0.84)	0.090 (0.77)	0.041 (0.35)
Plant Closing	0.195 (1.41)	0.206 (1.43)	0.158 (1.11)	0.378 * (2.23)	0.311 † (1.88)	0.277 † (1.68)
Depression (Baseline)	0.757 *** (40.51)	0.570 *** (25.99)	0.556 *** (25.14)	0.726 *** (42.84)	0.537 *** (27.27)	0.520 *** (26.24)
Non-White	---	-0.014 (0.31)	-0.008 (0.17)	---	0.168 ** (3.24)	0.175 ** (3.34)
High School or More	---	-0.253 *** (4.94)	-0.249 *** (4.83)	---	-0.268 *** (4.13)	-0.272 *** (4.15)
Some College or More	---	-0.112 ** (2.83)	-0.111 ** (2.79)	---	-0.147 *** (3.78)	-0.154 *** (3.89)
Married/Partnered	---	-0.241 *** (4.43)	-0.238 *** (4.33)	---	-0.066 (1.59)	-0.073 † (1.73)
White-Collar Occupation	---	-0.035 (0.89)	-0.032 (0.81)	---	-0.223 ** (3.03)	-0.221 ** (2.96)
Employer Tenure	---	-0.005 *** (3.64)	-0.006 *** (4.30)	---	-0.008 ** (3.26)	-0.008 ** (3.48)
Fulltime Worker	---	0.089 † (1.68)	0.207 *** (3.54)	---	0.212 *** (3.97)	0.260 *** (4.54)
Physical Health	---	-0.270 *** (6.43)	-0.264 *** (6.25)	---	-0.252 *** (5.40)	-0.247 *** (5.24)
Num. Health Conditions	---	0.082 *** (4.18)	0.076 *** (3.87)	---	0.120 *** (5.56)	0.119 *** (5.44)
Post-Loss Nonemployment	---	---	0.245 *** (4.67)	---	---	0.150 ** (2.81)
Spell	-0.040 † (1.83)	-0.004 (0.19)	-0.008 (0.39)	-0.035 (1.40)	0.013 (0.55)	0.007 (0.27)
Constant	0.476 *** (10.55)	1.099 *** (10.98)	0.980 *** (9.60)	0.621 *** (11.93)	1.131 *** (10.20)	1.105 *** (9.890)
Wald χ^2	1660.57	1419.90	1422.17	1866.90	1629.75	1557.02
Number of Observations	5766	5766	5766	6315	6315	6315
Number of Groups	2188	2188	2188	2283	2283	2283

Notes: Numbers in parentheses are t-ratios.

†p<.10 *p<.05 **p<.01 ***p<.001 (two-tailed tests)

Figure 1. Mean Predicted Values Based on Full Set of Pre-Displacement Covariates: By Sex

