

** Prepared for PAA 2012 submission – Please do not quote or cite **

**Persistence and Change in Perceived Employment Uncertainty and Adult Health:
Evidence from the Michigan Recession and Recovery Study***

Sarah Burgard
University of Michigan

* Acknowledgements: This study was supported by funds provided to the National Poverty Center (NPC) at the University of Michigan by the Office of the Assistant Secretary for Planning and Evaluation at the U.S. Department of Health and Human Services and by the Office of the Vice President for Research, University of Michigan, and by grants from the John D. and Catherine T. MacArthur Foundation, and the Ford Foundation. I thank Tedi Castelli and Danielle Battle for assistance with coding and analyzing the data, Lucie Kalousova and Maria Wathen for research assistance, Sheldon Danziger for his leadership on the project, Shawn Pelak for managing the project, Kristin Seefeldt for excellent feedback and staff at the Survey Research Operations unit at the Institute for Social Research for gathering the data.

ABSTRACT

Although the Great Recession has officially ended, concern about employment uncertainty persists. Using panel data collected in late 2009/early 2010 and in spring of 2012, this paper will examine associations between perceived employment insecurity – a worker’s concern that job loss is likely – and several measures of health. Using wave 1 data, I find that individuals perceiving job insecurity have significantly worse self-rated health and are more likely to meet criteria for major or minor depression or to report a recent anxiety attack. Results are robust to adjustment for selection of individuals into these employment situations on the basis of socio-demographic characteristics, earlier health diagnoses, and objective employment disruptions like recent layoffs or unemployment. Robustness of these associations will be examined using the soon-to-be-available wave 2 data, and extended with measures of stability and change in perceived insecurity and models of health change.

INTRODUCTION

While the Great Recession that began in December 2007 has officially ended, insecurity for workers has not abated. Historically high unemployment rates followed by a very slow and “jobless” economic recovery may be negatively impacting adults’ health, even those who have not lost their jobs. A growing number of studies have shown that individuals who believe they could lose their job in the near future have poorer mental and physical health. Some studies suggest that persistent perceived insecurity is most strongly associated with poor health (Burchell 2011; Burgard, Brand, and House 2009; Ferrie, Shipley, Marmot, Stansfeld, and Smith 1998c), making the slow and fragile macroeconomic recovery that is underway particularly troubling.

Despite the growing evidence for an association between perceived job insecurity and health, however, the potential consequences of unusually high levels of threat to employment security in the Great Recession are still not known. Extant empirical evidence for the link between perceived job insecurity and health is based on data that were collected during more typical macroeconomic periods. This recent recession was unusual in several ways, involving crises in multiple domains: housing markets collapsed, the stock market saw major volatility, and employment stability was drastically undermined.

Because of these unique conditions of the Great Recession, the association between perceived job insecurity and health may be distinctive in recent years. Hardships in employment and other material domains have affected more people than usual, and this means that there could be more heterogeneous consequences for health than in more typical periods. Characteristics of workers, such as their level of education, will likely influence the persistence of their perceived insecurity, as those in more favorable labor market positions may be better poised to keep their jobs or find more stable arrangements as the economy recovers. Social characteristics like education could also moderate the consequences of perceived job insecurity. The health consequence of insecurity may be more serious for individuals who have never before experienced it, or conversely, could be worse for those who have more typically dealt with employment insecurity and related problems. In sum, considering the social factors predicting persistent perceived job insecurity - versus intermittent insecurity or none at all - will help to show the potential contribution to social gradients in health post-Recession. Examining potential moderating effects of individuals’ sociodemographic characteristics and job quality could reveal differences or similarity in the association between perceived job insecurity and health.

In addition to the unusual reach of the Great Recession into groups normally shielded from volatility, this Recession also involved historically high levels of objective employment shocks. The Bureau of Labor Statistics reported that between December 2007 and October 2009 the unemployment rate rose from 5 percent to just over 10 percent, with about 40 percent of the unemployed having been jobless for six months or longer (2010). These high levels of employment disruption raise the possibility that any association found between perceptions of job insecurity and health could be spurious, if both are caused by job loss, unemployment, or other hardships known to have negative consequences for health. There is considerable evidence for an association between job loss and poorer mental (Goldman-Mellor, Saxton, and Catalano 2010), and physical health (Burgard, Brand, and House 2007; Gallo, Brand, Teng, Leo-Summers, and Byers 2009; Strully 2009). While there is evidence from earlier periods that perceived insecurity is associated with health net of objective job shocks (Burchell 2011; Burgard, Brand, and House 2009; Rugulies, Thielen, Nygaard, and Diderichsen 2010), the question requires further exploration in the context of the Great Recession.

This study will examine the likelihood that individuals perceived job insecurity in the wake of the Great Recession, how long-lasting perceived job insecurity is for different groups, will assess its association with their health, and will explore whether these associations vary across social groups. These unique data, which provide some of the earliest perspective on the potential health consequences of the Great Recession, come from a population-based sample living in the metropolitan Detroit area in late 2009. Southeast Michigan has suffered tremendously from the Recession and has had one of the highest unemployment rates in the country. While the city of Detroit has many poor and predominantly Black residents, Southeast Michigan as a whole has a substantial number of working class and middle class African Americans and whites, allowing us to examine the experiences of a wide array of workers. I examine several measures of health that could capture the short-to-medium term influence of stress due to perceived job insecurity. These data also allow us to isolate perceived job insecurity from an array of objective employment disruptions that could occur before or after the first survey wave, providing a stronger test of its association with health than has been available in some prior studies.

BACKGROUND

Prior research on employment insecurity and health

A great deal of prior research has shown that across a wide variety of contexts and time periods, individuals' job loss and unemployment are associated with increased risk of psychological distress (Burgard, Brand, and House 2007; Dooley, Catalano, and Wilson 1994; Gallo, Bradley, Siegel, and Kasl 2000), increased physician consultations, illness episodes, and hospital referrals and attendance (Beal and Nethercott 1987; Hamilton, Broman, Hoffman, and Renner 1990; Keefe, Reid, Ormsby, Robson, Purdie, Baxter, and Ngati Kahunguni Iwi Incorporated 2002), a greater number of reported medical conditions and pension disability use (Ferrie, Shipley, Marmot, Stansfeld, and Smith 1998b; Westin 1990), and poorer physical functioning (Gallo, Bradley, Siegel, and Kasl 2000) and self-reported physical illness (Turner 1995).

However, increasing evidence suggests that the negative anticipation of job loss has its own negative consequences for health, even net of actual job losses that cause individuals to be fearful even after they are reemployed, or that may be impending when perceived insecurity is measured. Existing studies suggest that perceived job insecurity exerts negative effects on mental health and well-being (Burgard, Brand, and House 2006; De Witte 1999; Dekker and Schaufeli 1995; Ferrie, Shipley, Marmot, Stansfeld, and Smith 1998a), with fewer showing negative associations with self-rated health or morbidity (Burgard, Brand, and House 2009; Ferrie, Shipley, Marmot, Stansfeld, and Smith 1995; Kasl and Cobb 1970; Pelfrene, Vlerick, Moreau, Mak, Kornitzer, and De Backer 2003), physical symptoms (Ferrie et al. 1998a; Heaney, Israel, and House 1994), and cardiovascular risk factors (Arnetz, Brenner, Levi, Hjelm, Petterson, Wasserman, Petrini, Eneroth, Kallner, and Kvetnansky 1991; Ferrie, Shipley, Marmot, Martikainen, Stansfeld, and Davey Smith 2001; Kasl and Cobb 1970; Siegrist, Matschinger, Cremer, and Seidel 1988). Few studies of perceived job insecurity have been longitudinal, but those that examine persistent insecurity find it more strongly associated with poor health than intermittent insecurity (e.g., Burgard, Brand, and House 2009).

An individual worried about losing a job may experience stress due to anticipation about the problems associated with a job loss, mental strain associated with being in a powerless position, and ambiguity about the future (Heaney, Israel, and House 1994; Joelson and Wahlquist 1987). Workers' responses to the stress of perceived job insecurity in the shorter term could be emotional (anxiety, tension, dissatisfaction), physiological (elevated heart rate, increased catecholamine secretion) and behavioral (drug use, absenteeism, lack of concentration, more risk-taking on the job), while in the longer term, the

accumulation of these responses could result in more permanent and manifest adverse consequences for mental and physical health (Gazzaniga and Heatherton 2003; Heaney, Israel, and House 1994).

At the same time, it is important to remember that selection forces may provide an alternative explanation for the associations between employment uncertainty and health. Some workers have characteristics that make them more prone to both job insecurity and health decline. Poor health earlier in life is clearly a risk factor for both employment uncertainty and future health, but other characteristics may also be confounders, including low education or gender, if these select people unequally into insecure jobs or industries and are associated with subsequent poor health. Some longitudinal studies have adjusted for measures of prior health and other individual characteristics to address potential reverse causation due to health selection, and still found a link between perceived insecurity and subsequent health (De Witte 1999; Dekker and Schaufeli 1995; Ferrie et al. 1998c; Heaney, Israel, and House 1994; Hellgren and Sverke 2003), but these studies have used data from more stable macroeconomic periods or from social contexts with more robust social welfare systems. In addition to controlling for worker characteristics, then, I also consider how these characteristics could be modifiers of an association between perceived job insecurity and health, as discussed above. Moreover, in analyses still to be completed (when the new wave of data becomes available), I will examine how perceived job insecurity (at baseline and across waves) is associated with changes in health between waves, providing a more robust test.

DATA AND METHODS

Data

Data come from the Michigan Recession and Recovery Study (MRRS). The MRRS was designed to follow a stratified random sample of English-speaking adults aged 19-64 who lived in Southeastern Michigan (Macomb, Oakland, and Wayne counties) at the time of the initial data collection in late 2009/early 2010. The MRRS oversampled African Americans and includes mainly African American and non-Hispanic white respondents, reflecting the residential composition of the area. The MRRS survey instrument is unique in its depth and breadth, covering eight major domains: housing instability, demographic characteristics, employment and the labor market, income and assets, health and mental health, material hardships, credit and debt, and public program use. In the preliminary results presented here, I use data from the first wave of in-person survey interviews (*the second wave has just come out of the field and after we clean the data and create the weights it will be used in longitudinal analyses completed before the PAA meeting*). Administration of the first survey interview took approximately 60 minutes, and respondents were paid between \$50 and \$120 for their participation. A total of 914 respondents were interviewed, with a survey response rate of 82.8%. At wave 2, 847 respondents were re-interviewed and when removing cases who died after wave 1 and two respondents who were later discovered to be age-ineligible, resulting in a response rate of about 94%.

Following conventions in the literature, in the analyses presented below I use a sample of all respondents who were employed in the private or public sectors and 26 to 64 years old at wave 1, because self-employed workers face different kinds of employment insecurity than those with an employer, and young workers experience high levels of volatility in their early career that are viewed as more typical. These restrictions eliminated 396 respondents who were not employed at interview, 51 who were younger than 26, and 31 who were self-employed. I also used survey commands to take account of 43 cases who were missing data on a covariate or outcome variable. (*I am currently examining results using multiply imputed data to explore how these 47 cases influence the estimates*) These restrictions result in an analytic sample of 393 individuals at wave 1.

Measures

Perceived job insecurity

For all employed MRRS respondents, we measured perceived employment insecurity among the employed with an item that asked: “Thinking about the next 12 months, how likely do you think it is that you will lose your job or be laid off – very likely, fairly likely, not too likely, leaving the labor force?” I recoded responses so that 1 = very or fairly likely and 0 = not too likely or leaving the labor force. Using this dichotomous indicator, 17.8% of the analytic sample perceived job insecurity at wave 1. *(For the longitudinal analyses, a measure of persistence of perceived job insecurity will be created that considers responses at both waves, with categories for insecure at neither wave, wave 1 only, wave 2 only, and both waves).* Table 1 shows descriptive characteristics for the sample at wave 1, stratified by perceived insecurity status. P-values from Wald tests indicate whether differences between the insecure and not insecure are statistically significant.

Health Measures

I studied several measures of health: self-rated health, depression, anxiety, and alcohol use. Self-rated health is measured here with the typical item: “Would you say that your health in general is excellent, very good, good, fair, or poor?” I collapsed the item so that poor or fair health = 1 while excellent, very good, or good health = 0, a typical cut point. Depression was measured using the Patient Health Questionnaire (PHQ), a validated 9-item scale based on the diagnostic criteria for major depressive disorder in the Diagnostic and Statistical Manual Fourth Edition (DSM-IV) (Kroenke and Spitzer 2002). The PHQ-9 has two components that: (1) assess symptoms and functional impairment over the past 2 weeks to make a tentative diagnosis, and (2) can be used to derive a severity score (designed to help clinicians select and monitor treatment). Respondents were classified as meeting symptomatic criteria for major or minor depression according to guidelines provided by creators of the scale, so that meeting criteria = 1 and not meeting criteria = 0. I also measured recent experience of serious anxiety with an item that asked: “In the last 4 weeks, have you had an anxiety attack – suddenly feeling fear or panic?” This item came from the PHQ-brief instrument, a validated scale (Lowe, Grafe, Zipfel, Spitzer, Herrmann-Lingen, Witte, and Herzog 2003). I used the Alcohol Use Disorders Identification Test (AUDIT), a ten-item scale of recent alcohol use, alcohol dependence symptoms, and alcohol related problems. A cut point recommended by the scale’s creators was used to distinguish harmful and hazardous use (=1) from less use (=0). Table 1 indicates that respondents who currently report perceived job insecurity fare significantly worse on all health measures except harmful or hazardous alcohol use.

To address health selection in models predicting self-rated health, I created an indicator for whether the respondent had been diagnosed with any serious, chronic condition at least three years before the survey, and respondents were coded 1 if they had been diagnosed with any condition, regardless of how much it currently limits their normal daily activities. The conditions included: heart attack; coronary heart disease, angina, or congestive heart failure; high blood pressure or hypertension; asthma; chronic lung disease such as bronchitis, emphysema or chronic obstructive pulmonary disease (COPD); diabetes or high blood sugar; arthritis or rheumatism; cancer or a malignant tumor; or “any other serious, chronic condition that a doctor or other health professional ever told you that you have or had.” To address selection on the basis of a previous mental health problem, I created a parallel indicator of being diagnosed with any emotional, nervous, or psychiatric problems at least three years ago. There were not significant differences in the presence of preexisting mental conditions for those who were insecure compared to those not perceiving job insecurity, but the insecure were more likely to have a preexisting physical condition. *(The final version of the paper will use wave 2 health and adjust for wave 1 health, providing additional adjustment for potential health selection.)*

Other Measures

Other predictors included the respondent's age in years, gender, race (African American versus not), partnership status (married or cohabiting versus not), presence of children in the household, educational attainment (bachelor's degree or more versus less education), and income-to-needs ratio for the 2008 tax year (ratio of 2 or more versus ratio less than two, indicating poor or near poor status).

I also measured recent experiences with objective job instability. MRRS captured recent unemployment experience via a monthly calendar of labor market activity that started in January 2007 and ended in the month of interview. (*This calendar extends fully between waves 1 and 2 and will be utilized in the final version of the paper*). I categorized respondents as experiencing no months of unemployment over that period, one to 5 months of unemployment, or six or more months of unemployment. Other employment events that could induce insecurity were captured via a series of questions that used a stem statement: "Businesses are doing different things to cope with the recession. Some are using lay off days, or furlough days, as a way of cutting costs, while others are simply reducing wages." Employed respondents were then asked whether in the past 12 months they: (1) had to take a wage reduction, (2) had been furloughed, or (3) had been laid off. Those reporting perceived insecurity were significantly more likely to report most of these types of recent employment instability.

To explore how job quality might influence the salience of perceived job insecurity for health, I included measures of source of health insurance coverage (no insurance, own employer provides insurance, other source of insurance), union membership, public versus private employment sector, and whether the respondent was working in the automotive industry, a particularly hard hit industry in the region. While none of these showed major differences across the secure and insecure, perceived job insecurity was not surprisingly significantly higher among those working as temporary employees.

Methods

I present descriptive bivariate and multivariate analyses to explore our research questions. All analyses account for the complex sample survey design by using the "svy" commands in Stata 11SE, and weights are used that address sample non-response and make the sample representative of English-speaking adults ages 19 to 64 years old living in the three-county area in Southeastern Michigan. Multivariate models use logistic regression, with results presented as odds ratios with 95% confidence intervals.

PRELIMINARY RESULTS

Table 2 presents key odds ratios from a series of logistic regressions in which each of the four health outcomes of interest are regressed on perceived employment insecurity, with a series of control variables added in subsequent models. (*All data presented in these initial tables are drawn from wave 1 of MRRS for these results, but they will be updated to include wave 2 data on outcomes and perceived and objective job instability before the PAA meeting*). Table 2 shows odds ratios and 95% confidence intervals, so a value greater than 1.0 indicates greater likelihood, and an odds ratio less than 1.0 indicates lower likelihood of health problems. Model 1 includes controls for the respondent's age, sex, race group, marital/partner status, educational attainment, and income to needs ratio from 2008, with subsequent models adding additional controls or specifications. Model 2 adds a control for prior health (chronic condition for the model of self-rated health, mental condition for models of depression, anxiety, and alcohol use). To Model 2, Model 3 adds recent unemployment experience, Model 4 adds recent layoff, Model 5 adds recent furlough, and Model 6 adds measures of union membership and whether the respondent was a temporary employee. Model 7 omits temporary employees to see if they fully account for the associations in earlier models.

Table 2 shows that after adjusting for a host of characteristics that select individuals into different employment situations, and a number of possible alternative explanations, perceived employment insecurity is strongly and significantly associated with a greater risk of fair or poor self-rated health, meeting criteria for depression, and a recent anxiety attack in most models. Perceived insecurity is not associated with harmful or hazardous alcohol use. While they are not shown here to conserve space, other independent variables are associated with health in expected ways.

In Table 3, I pursue a stronger test of the potential influence of objective employment shocks on the associations found above. I interact perceived with objective insecurity, creating four categories of experiences: neither experienced, only perceived insecurity, only the focal objective employment shock, or both experienced. Selected findings in Table 3 show that this specification does not greatly change the substantive story about perceived job insecurity – even when it is the only employment problem, the association with health remains strong and significant in most cases.

Models not presented examined potential moderators of the relationship between perceived job insecurity and health. I considered a wide range of factors, including sociodemographic characteristics (gender, age group, parental status, breadwinner status, educational attainment) and measures of job quality (health insurance source, availability of coverage for dependents from respondent's job, availability of retirement benefits for respondent). The results generally suggested few moderating influences, though it did appear that high job quality might heighten the consequences of perceived insecurity for anxiety. Further research with larger samples is needed, as is longitudinal analyses that can incorporate the duration of exposure to perceived insecurity.

(For the PAA meeting draft of the paper, a fully longitudinal analysis will be added to explore the robustness of these cross sectional results, and robustness checks will be conducted.)

PRELIMINARY DISCUSSION

Using very recently-collected data from Southeast Michigan, this study found that perceived employment insecurity was strongly associated with health in a Great Recession sample of workers from across the labor force. Selection of workers into jobs based on their sociodemographic characteristics helps to explaining the association somewhat, as does controlling for prior health problems. However, the odds of poor physical or mental health remain substantially higher for insecure workers even after these alternative explanations for poor health are addressed, and after I address objective employment shocks as a potential confounder. I did not find strong evidence that these associations varied across different groups of workers, though future research with larger samples is needed to carefully explore potential differences.

Perceived job insecurity is not a socially-visible event like job loss or unemployment, but an internal experience for which there are no obvious appropriate responses and no institutionalized supports. Also, people experiencing perceived job insecurity cannot employ instrumental strategies of coping because of the persistent uncertainty about whether or not the feared employment instability will actually occur. These circumstances make perceived insecurity potentially as stressful, or perhaps even more stressful, than actual job losses or unemployment episodes (Hartley, Jacobson, Klandermans, and van Vuuren 1991; Lazarus 1966). Moreover, institutional supports like unemployment insurance or other transitional programs do not help the insecure worker. However, changes in supports for displaced workers that afford a stronger safety net could potentially make the prospect of job loss less stressful for those hanging onto their jobs. It is also possible that workers who are able to take the

initiative to look for jobs while they still hold the insecure position may experience less stress as they are exercising some self-determination in the face of uncertainty. I explored this possibility in models using active job search status as a moderator, and did not find strong evidence that it differentiated workers in terms of associations with health, but this remains an important avenue of future examination. It is possible, however, that in this slow economic recovery even searchers feel the futility of their actions.

These findings provide important information for intervention and planning, particularly as the recessionary conditions will be slow to recede in Southeast Michigan and many other locales, and perceived job insecurity may not wane for some time. (*Descriptive data on persistence of perceived job insecurity and its association with health will be available in the final version of the paper*). However, while it provides a novel and timely look at experiences of the Great Recession and the links between employment uncertainty and health, these data have characteristics that limit the generalizability of these findings and the robustness of our inferences at this time. First, while we have prioritized collecting a population representative sample with a high response rate, the sample represents the three county area around Detroit, Michigan, a region that has unique characteristics. In some ways, limiting the sample to this region also strengthens the results, because we are in a sense “controlling” on a similar set of local and environmental conditions, such as the nature of the housing market, the availability of jobs and the nature of industrial change, all of which could otherwise act as unmeasured confounders.

A second limitation is that while MRRS includes a variety of health measures common to research on employment uncertainty, these are self-reported measures. Self-reported measures of health and of employment experiences, coupled with the cross sectional data available in the first wave of the study, mean that these findings could be caused by negative reporting styles among some respondents (i.e., neuroticism). As future waves of MRRS data become available, I will examine within-person changes, helping to adjust for unmeasured differences across respondents in their reporting styles and other characteristics. Moreover, I will be better able to assess the temporal ordering of employment events and chronic strains, behavioral responses, and health changes, providing a more convincing view of the contributions of health causation and health selection to these associations.

Additionally, I don’t take other recession-related events into account in these analyses, such as changes in health insurance coverage, housing instability, worsening of debt, increased family strain, or other stressful or financially damaging experiences. These could act as confounders or mediators of the association between employment uncertainty and health, or they could have synergistic effects or exacerbate the negative consequences of employment shocks. In future work I will examine the clustering and ordering of negative life events of these kinds, as well as the ways that positive resources like social support and social program use may buffer their effects.

SOURCES

2010. "Long-term unemployment in December 2009." in *TED: The Editor's Desk*,. Washington, D.C.: U.S. Bureau of Labor Statistics, Division of Information and Marketing Services.
- Arnetz, B., Sten-Olof Brenner, Lennart Levi, R. Hjelm, I.L. Petterson, S. Wasserman, B. Petrini, P. Eneroth, A. Kallner, and R. Kvetnansky. 1991. "Neuroendocrine and Immunologic Effects of Unemployment and Job Insecurity." *Psychotherapy and Psychosomatics* 55:76-88.
- Beal, N. and S. Nethercott. 1987. "The Health of Industrial Employees Four Years After Compulsory Redundancy." *Journal of the Royal College of General Practitioners* 37:390-394.
- Burchell, Brendan. 2011. "A temporal comparison of the effects of unemployment and job insecurity on wellbeing." *Sociological Research Online* 16.
- Burgard, Sarah A., Jennie E. Brand, and James S. House. 2006. "Job Insecurity and Health in the United States." *Social Science and Medicine* 69:777-785.
- . 2007. "Toward a Better Estimation of the Effect of Job Loss on Health." *Journal of Health and Social Behavior* 48:369-384.
- . 2009. "Perceived Job Insecurity and Worker Health in the United States." *Social Science and Medicine* 69:777-785.
- De Witte, H. 1999. "Job Insecurity and Psychological Well-Being: Review of the Literature and Exploration of Some Unresolved Issues." *European Journal of Work and Organizational Psychology* 8:155-177.
- Dekker, S.W.A. and W.B. Schaufeli. 1995. "The Effects of Job Insecurity on Psychological Health and Withdrawal: A Longitudinal Study." *Australian Psychologist* 30:57-63.
- Dooley, David, Ralph Catalano, and G. Wilson. 1994. "Depression and Unemployment: Panel Findings from the Epidemiologic Catchment Area Study." *American Journal of Community Psychology* 22:745-765.
- Ferrie, Jane E., M.J. Shipley, Michael Gideon Marmot, S.A. Stansfield, and G.D. Smith. 1998a. "An Uncertain Future: The Health Effects of Threats in Employment Security in White-Collar Men and Women." *American Journal of Public Health* 88:1030-1036.
- Ferrie, Jane E., Martin J. Shipley, M.G. Marmot, Pekka Martikainen, Stephen Alfred Stansfeld, and George Davey Smith. 2001. "Job Insecurity in White-Collar Workers: Toward an Explanation of Associations with Health." *Journal of Occupational Health Psychology* 6:26-42.
- Ferrie, Jane Elizabeth, Martin John Shipley, Michael Gideon Marmot, Stephen Alfred Stansfeld, and George Davey Smith. 1995. "Health Effects of Anticipation of Job Change and Non-employment: Longitudinal Data from the Whitehall II Study." *British Medical Journal* 311:1264-1269.
- . 1998b. "The Health Effects of Major Organizational Change and Job Insecurity." *Social Science and Medicine* 46:243-254.
- Ferrie, Jane Elizabeth, Martin Shipley Shipley, Michael Gideon Marmot, Steven Alfred Stansfeld, and George Davey Smith. 1998c. "An Uncertain Future: The Health Effects of Threats to Employment Security in White-Collar Men and Women." *American Journal of Public Health* 88:1030-1036.
- Gallo, William T., Elizabeth H. Bradley, Michele Siegel, and Stanislav V. Kasl. 2000. "Health Effects of Involuntary Job Loss Among Older Workers: Findings From the Health and Retirement Study." *Journal of Gerontology: Social Sciences* 55B:S131-S140.
- Gallo, William T., Jennie E. Brand, Hsun-Mei Teng, Linda Leo-Summers, and Amy L. Byers. 2009. "Differential impact of involuntary job loss on physical disability among older workers: Does predisposition matter?" *Research on Aging* 31:345-360.
- Gazzaniga, M.S. and T.F. Heatherton. 2003. *Psychological Science: Mind, Brain, and Behavior*. New York: W.W. Norton Company.
- Goldman-Mellor, Sidra J., Katherine B. Saxton, and Ralph C. Catalano. 2010. "Economic contraction and mental health: A review of the evidence." *International Journal of Mental Health* 39:6-31.

- Hamilton, V.K., C.L. Broman, W.S. Hoffman, and D.S. Renner. 1990. "Hard Times and Vulnerable People: Initial Effects of Plant Closings on Autoworkers' Mental Health." *Journal of Health and Social Behavior* 31:123-140.
- Hartley, J., D. Jacobson, B. Klandermans, and T. van Vuuren. 1991. *Job insecurity: Coping with jobs at risk*. London: Sage.
- Heaney, Catherine A., Barbara A. Israel, and James S. House. 1994. "Chronic Job Insecurity Among Automobile Workers: Effects on Job Satisfaction and Health." *Social Science and Medicine* 38:1431-1437.
- Hellgren, Johnny and Magnus Sverke. 2003. "Does Job Insecurity Lead to Impaired Well-Being or Vice Versa? Estimation of Cross-Lagged Effects Using Latent Variable Modelling." *Journal of Organizational Behavior* 24:215-236.
- Joelson, L. and L. Wahlquist. 1987. "The Psychological Meaning of Job Insecurity and Job Loss: Results of a Longitudinal Study." *Social Science and Medicine* 25:179-182.
- Kasl, S.V. and S. Cobb. 1970. "Blood Pressure Changes in Men Undergoing Job Loss: A Preliminary Report." *Psychosomatic Medicine* 32:19-38.
- Keefe, Vera, Papaarangi Reid, Clint Ormsby, Bridget Robson, Gordon Purdie, Joanne Baxter, and Ngati Kahunguni Iwi Incorporated. 2002. "Serious Health Events Following Involuntary Job Loss in New Zealand Meat Processing Workers." *International Journal of Epidemiology* 31:1155-1161.
- Kroenke, K and RL Spitzer. 2002. "The PHQ-9: A new depression and diagnostic severity measure." *Psychiatric Annals* 32:509-521.
- Lazarus, R. S. 1966. *Psychological stress and the coping process*. New York: McGraw-Hill.
- Lowe, Bernd, Kerstin Grafe, Stephan Zipfel, Robert L. Spitzer, Christoph Herrmann-Lingen, Steffen Witte, and Wolfgang Herzog. 2003. "Detecting panic disorder in medical and psychosomatic outpatients: Comparative validation of the Hospital Anxiety and Depression Scale, the Patient Health Questionnaire, a screening question, and physicians' diagnosis." *Journal of Psychosomatic Research* 55:515-519.
- Pelfrene, Edwin, Peter Vlerick, Michel Moreau, Rudolf P. Mak, Marcel Kornitzer, and Guy De Backer. 2003. "Perceptions of Job Insecurity and the Impact of World Market Competition as Health Risks: Results from Belstress." *Journal of Occupational and Organizational Psychology* 76:411-425.
- Rugulies, R., K. Thielen, E. Nygaard, and F. Diderichsen. 2010. "Job insecurity and the use of antidepressant medication among Danish employees with and without a history of prolonged unemployment: A 3.5-year follow-up study." *Journal of Epidemiology and Community Health* 64:75-81.
- Siegrist, J., H. Matschinger, P. Cremer, and D. Seidel. 1988. "Atherogenic Risk in Men Suffering from Occupational Stress." *Atherosclerosis* 69:211-218.
- Strully. 2009. "Job Loss and Health in the U.S. Labor Market." *Demography* 46:221-246.
- Turner, J. Blake. 1995. "Economic Context and the Health Effects of Unemployment." *Journal of Health and Social Behavior* 36:213-229.
- Westin, Steinar. 1990. "The Structure of a Factory Closure: Individual Responses to Job-Loss and Unemployment in a 10-year Controlled Follow-Up Study." *Social Science and Medicine* 31:1301-1311.

Table 1. Descriptive characteristics by analytic sample, MRRS respondents 26 to 64 employed in public or private sector.

	Not Insecure	Insecure	p for diff.
% Fair/Poor Self-Rated Health	7.5%	20.6%	0.005
% Minor or major depressive symptomatology	8.4%	47.0%	<.001
% Anxiety attack past month	9.5%	29.2%	0.003
% Harmful or hazardous alcohol use	20.9%	29.4%	0.389
% Chronic condition diagnosed at least 3 years ago	36.7%	53.3%	0.036
% Mental condition diagnosed at least 3 years ago	8.7%	18.7%	0.201
Age in years	43.3 (0.58)	44.4 (0.92)	0.427
% Female	53.3%	51.8%	0.911
% African American	16.9%	24.7%	0.075
% Married or Cohabiting	73.4%	76.8%	0.664
% with children under 18 in household	55.3%	45.9%	0.319
% Bachelor's degree or more	39.3%	23.3%	0.032
% Income-to-needs ratio 2008 < 2	18.2%	17.7%	0.920
Health insurance status			0.428
% None	9.8%	9.0%	
% Other source	23.1%	15.0%	
% Own employer-based	67.1%	76.0%	
% Union member	21.0%	16.2%	0.403
% Temporary employee	2.0%	10.3%	0.002
% Public employment sector	15.3%	7.56%	
% In automobile industry	26.0%	25.0%	0.885
Recent unemployment experience			0.032
% None	83.2%	69.4%	
% < 6 months	7.9%	8.0%	
% 6+ months	8.9%	22.6%	
% Employer offers dependent insurance	71.6%	70.9%	0.936
% Employer offers retirement benefits	45.4%	47.4%	0.848
% With wage reduction in past 12 months	16.8%	27.7%	0.114
% With furlough in past 12 months	18.4%	42.9%	0.005
% Laid off in past 12 months	7.4%	19.0%	0.012
N	313	80	

Table 2. Summary results from selected logistic regression models of health outcomes (odds ratios).

	Fair/poor SRH	PHQ9 Depression	Anxiety Attack	Harmful or Hazardous Alcohol Use
M1: basic controls	3.0*	9.6***	4.1**	1.6
M2: M1 + prior health	2.9*	8.8***	3.2*	1.4
M3: M2 + recent unemployment experience	2.9*	8.5***	3.1**	1.4
M4: M2 + recent layoff	2.9*	9.4***	3.4*	1.4
M5: M2 + recent furlough	2.5†	7.4***	3.1*	1.3
M6: M2 + union + temporary employee	2.5*	7.9***	3.7**	1.4
M7: M2, dropping temporary employees	2.2†	7.5***	3.8**	1.4

Note: † p<.10, * p<.05, ** p<.01, *** p<.001. All models adjust for age, sex, race group, partnership status, educational attainment, and income to needs ratio in 2008.

Table 3. Selected summary results from logistic regression models, with categorical indicators of objective and perceived job insecurity (odds ratios).

	Fair/poor SRH	PHQ9 Depression	Anxiety Attack	Harmful or Hazardous Alcohol Use
Model 8: Unemployed 6+ mo & Perceived Insecurity				
Neither (omitted)	1.0	1.0	1.0	1.0
Insecure only	3.1*	10.7***	3.9*	1.7
Unemployment only	0.8	1.8	0.9	1.2
Both	2.3	9.0***	4.6*	1.4
Model 9: Laid off past 12 mo & Perceived Insecurity				
Neither (omitted)	1.0	1.0	1.0	1.0
Insecure only	2.3	10.5***	4.4**	1.4
Laid off only	0.13*	0.5	0.3	0.4
Both	5.3**	5.0*	1.6	2.2

Note: † p<.10, * p<.05, ** p<.01, *** p<.001. All models adjust for age, sex, race group, partnership status, educational attainment, income to needs ratio in 2008, and earlier health.