Job Insecurity and Change Over Time in Health Among Older Men and Women

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Objectives. We estimated associations between job insecurity and change over time in the physical and psychological health of older adult men and women.

Methods. We conducted secondary analyses of longitudinal data from men and women ($N = 190$) born between 1935 and 1952 in the Chicago Health, Aging, and Social Relations Study. We used multivariate regression techniques to test the association of job insecurity with changes in physical health (self-reported global health, resting blood pressure, and urinary catecholamines [epinephrine]) and psychological health (depressive symptoms, hostility, loneliness, and personal stress). We controlled for individual characteristics and baseline measures of the outcomes.

Results. Men who experience job insecurity rate themselves in significantly poorer physical health and have higher blood pressure and higher levels of urinary catecholamines compared with men who do not experience job insecurity and women who do. Women who experience job insecurity show higher depressive symptoms and report more hostility, loneliness, and personal stress compared with women who do not experience job insecurity and men who do.

Discussion. The correlation between job insecurity and health is different in men and women but may be clinically significant in both populations and is a potentially important threat to older adults' health and well-being.

Key Words: Job insecurity—Mental health—Older adults—Physical health.

T HE better part of the 1990s was characterized as the "age of affluence," with a flourishing economy and extremely tight labor markets (Newman, 1999). The unusual trend of low inflation and low unemployment gave rise to hopes of a prosperous "new economy" in which the old business cycle—high inflation followed by high unemployment—would be conquered. Yet, what followed in the years 2000–2003 can only be described as an economic bust, with unemployment rates rising to 6.0% by 2003, the bottoming out of the stock market, and widespread job displacement reaching into the upper echelons of long-term professional workers (Uchitelle, 2006). The Chicago area alone (the site of our study) lost 180,500 jobs from its peak employment in January 2001 through June 2004 (Jones, 2004). The hoped-for "new economy" could now more accurately be described as the "new risk economy"—one in which company loyalty plummeted, public and private safety nets weakened, and plans for riding out a long-term job into a golden retirement became increasingly more difficult to realize (Hacker, 2006; Uchitelle).

Millions of workers have been or will be adversely affected by these economic shifts. This paper investigates how job insecurity, an important element of these economic trends, is associated with older workers' physical and psychological health. Because there are reasons to expect that job insecurity will be associated with the health of men and women in different ways, we examine the nature of such links separately for older men and women.

Job insecurity and health

Given the substantial economic consequences of job loss (Jacobson, LaLonde, & Sullivan, 1993), it is not surprising that workers threatened with the *potential loss* of their jobs would demonstrate stress, anxiety, and poor health outcomes. Job insecurity could challenge health and well-being because of the psychological strain associated with feeling a lack of control over one's situation or due to the anticipation of future unemployment, economic strain, and family problems (De Witte, 1999; Karasek & Theorell, 1990; Sverke, Hellgren, & Naswall, 2002). Physical health consequences could arise from the biological dysregulation associated with the release of stress hormones that affect the body's functioning, especially the immune system (Cohen, Doyle, & Baum, 2006). A key biological system posited to link stressor exposure to disease is the sympathetic adrenocortical axis, which operates on cells and viscera primarily through the release of the hormones epinephrine and norepinephrine. These hormones are increased by stress and are known to cause suppression of cellular immune functioning, increased blood pressure and heart rate, abnormal cardiac rhythms that have been linked to sudden death, and neurochemical imbalances that contribute to the development of psychiatric disorders (Cohen et al., 2006). Moreover, overnight urinary excretion rates of each of these hormones have been shown to predict mortality and functional decline (Reuben, Talvi, Rowe, & Seeman, 2000).

Evidence on the links between job insecurity and poor psychological and physical health and health-related behaviors comes especially from the prolific work of the Whitehall II research study, which began following a large cohort of prime-age white-collar London-based civil servants in 1988 and has produced numerous findings linking job insecurity to morbidity (Ferrie, Shipley, Marmot, Stansfeld, & Smith, 1995, Ferrie, Shipley, Marmot, Stansfeld, & Smith, 1998; Ferrie, Shipley, Newman, Stansfeld, & Marmot, 2005; Ferrie, Shipley, Stansfeld, & Marmot, 2002; Ferrie, Shipley, Stansfeld, Smith, & Marmot, 2003; see also Sverke et al. 2002 for a review).

In the present study, we assess whether others in the respondents' workplace have lost their jobs recently due to reorganization or downsizing or whether the respondent himself or herself has been demoted or disciplined at work. Downsizing in particular is a major antecedent of job insecurity (Westman, 2000). Downsizing and the imposition of diminished responsibilities at work are plausible "signals" that one's job is at risk, and such "signals" have been linked to poor health outcomes for those who remained employed (Kivimaki, Vahtera, Ferrie, Hemingway, & Pentti, 2001; Kivimaki, Vahtera, Pentti, & Ferrie, 2000; Westman).

Gender and job insecurity

Westman's (2000) review of the literature on gender and job insecurity revealed a "dearth" of information, according to the author. In contrast, broader literatures exist on the relationship between gender and stress and gender and unemployment. Results from these literatures can be extrapolated to formulate hypotheses about the relationship between gender and job insecurity.

First, men and women differ in their risk of physical and psychological morbidity (Federal Interagency Forum on Aging-Related Statistics, 2004; Heikkinen & Kauppinen, 2004; Os, Oparil, Gerdts, & Hoieggen, 2004), which could make them differentially susceptible to the effects of stress. Research has also established sex-specific responses to psychological stress in younger men and women in laboratory settings and has shown that responses are not explained by personality factors (Allen, Stoney, Owens, & Matthews, 1993; Stoney, Matthews, McDonald, & Johnson, 1988). A common finding from these and related studies is that across a range of psychological stress tasks, men react with higher blood pressure, epinephrine, and lipid responses than do women (Stroud, Niaura, & Stoney, 2001). This suggests that the stress of job insecurity might be more likely to be correlated with these types of physiological responses in men than women.

Beyond these biological factors, social and cultural factors could also play a role. The literature in this area suggests that adverse events that happen to others are more psychologically distressing for women than for men (Westman, 2000), possibly because women more often utilize and provide social support (Kessler & McLeod, 1984). Women are also more likely to enact emotion-focused coping strategies in the face of employment challenges (Westman). As such, one might expect to see larger associations between job insecurity and women's, rather than men's, psychological outcomes. Finally, role theory suggests that given the cultural salience of the male breadwinner role and the higher likelihood that men define themselves by their jobs (despite high levels of female labor force participation), the correlation between job insecurity and health outcomes will in general be stronger for men (Guimont et al., 2006; Levenstein, Smith, & Kaplan, 2001; Westman).

The empirical literature on the role of gender in moderating the associations between job insecurity and health outcomes is mixed, in part, because the few existing studies in this area tend to focus on a limited range of outcomes in any given study. However, in one study that examined a broad range of outcomes, Ferrie and colleagues (1995) reported that changes in reported physical health in response to job insecurity in the Whitehall study were larger for men, but that changes in psychological health were larger for women.

Relevance for older workers

The present study is situated in a broader literature on the employment experiences of older workers, a topic, which, though relatively neglected in the empirical literature (Slack & Jensen, 2008), is an increasingly important social issue. Older adults in the United States are living longer and working harder: Workers aged 55 years and older are the only sector among all age groups that has experienced strong growth in its participation rate in the labor market during the last two decades; they are likewise projected to have the fastest growth among all age groups in their labor force participation rates in the decade ahead (Toossi, 2007). A full 70% of working adults aged 45–74 years reported in 2007 that they planned to work in "retirement" or to never retire at all (American Association for Retired Persons, 2008).

But increased exposure to the labor market brings increased exposure to employment challenges. This too may be especially relevant for older workers. Slack and Jensen (2008), for example, show that older workers are at a clear disadvantage relative to middle-aged workers with respect to employment hardship (e.g., the risk of underemployment) and that this is especially true for older women. With retirement looming large and their slim chances of reemployment at an equally remunerative job, older workers have good reason to be worried and anxious in the face of company downsizing and reorganization. Older workers' health may also be more at risk, in general, given their more advanced age and their longer run exposure to stressful conditions or events in life and at work.

In summary, the present study makes important contributions by (a) examining the relationship between job insecurity and health among older workers, (b) testing whether this relationship is different for men and women, (c) considering a rich array of outcome measures including physiological indicators of cardiovascular functioning or stress,

and (d) using recent data collected during an era of high levels of job loss and unemployment.

METHODS

Sample

Data for this paper are drawn from the Chicago Health, Aging, and Social Relations Study (CHASRS), a longitudinal population-based study in Cook County, Illinois, conducted first in 2002 and readministered every year. The population consisted of persons born between 1935 and 1952, and the aim of CHASRS is to examine the social, psychological, and biological aspects of social isolation and health. The initial sample was 229 English-speaking Blacks, Hispanics, and non-Hispanic Whites aged 50–67 years. Respondents had to be ambulatory to come to the University of Chicago for a daylong laboratory visit. A multistage probability sampling design was used to select respondents, where Blacks and Hispanics were oversampled and gender equality was maintained. A sample of households was screened for the presence of an age-eligible individual, and if a household contained more than one age-eligible individual, the person with the most recent birthday was selected. Informed consent was obtained, and participants were paid $125 for participating in the first year. A quota sampling strategy ensured that approximately equal distributions of respondents across the six gender and race and/or ethnicity groups was obtained. The response rate among eligibles was 45%.

Comparisons to national data suggest that CHASRS represents the urban population aged 50–67 years well (Cacioppo, Hughes, Waite, Hawkley, & Thisted, 2006). The distribution of our sample on a number of characteristics (e.g., marital status, working status, self-rated health) compares closely with that obtained from the national population–based Health and Retirement Survey (HRS). For instance, self-rated health was rated as "excellent" or "very good" in 48% of 55- to 64-year-olds in the HRS (National Institute on Aging, National Institutes of Health, 2007) and in 40% of 50- to 68-year-olds in CHASRS (which oversampled Blacks and Hispanics with known poorer self-rated health status than Whites). In the U.S. population, 83%–87% of those aged 50–64 years are high-school graduates or more (Stoops, 2004), and in our sample, 84% are high-school graduates or more. CHASRS collected information on demographic characteristics, life events, as well as a range of psychological and physical measures.

For the purposes of our analysis, we first exclude the small number ($n = 7$) of respondents who report being retired or disabled at the Wave 1 survey. Our sample is further limited to households where the respondent participated in two consecutive waves of data collection (baseline to 1-year follow-up and 1-year to 2-year follow-up). This strategy allows a respondent to contribute one or two observations to the data set. A respondent contributes one observation if he or she participated in the first and second waves of data collection and two observations if he or she participated in all three waves of data collection. Should a respondent participate in the baseline survey and no others, or the baseline survey and the third survey, he or she contributes no observations to the analysis. We also require that data are not missing on control variables. Finally, we exclude from the analysis a small number ($n = 5$) of respondents who experienced a job loss in either of the two observation periods. In most instances, these job losers also experienced job insecurity and we wished to avoid confounding the potentially different effects of these two experiences. In sum, we are left with a sample of 190 respondents (91 men and 99 women) who contribute 326 observations (54 respondents contribute one observation and 136 contribute two).

Dependent Variables

Physical health–related measures.—The first measure of physical health functioning is systolic blood pressure (SBP), a well-recognized cross-sectional predictor of cardiovascular disease (Chobanian et al., 2003). Participants were seated in a comfortable padded chair, and a Colin Vital Statistics Monitor (Model BP 508; Vital Signs, Minster, OH) was used to obtain SBP readings from the nondominant arm, which was supported at the heart level by a cushion resting on the arm of the participant's chair. Blood pressure was recorded during an orthostatic stress protocol that consisted of a 2-min sitting epoch, followed by a 4-min standing epoch and ending with another 2-min sitting epoch. A 2-min adaptation period followed each postural change before recording commenced. In the following analyses, we focus on SBP averaged across 4 min in a seated posture.

The second measure of physical health functioning is the concentration of epinephrine in overnight urine samples. Before each participant's scheduled laboratory assessment day, the participant was mailed a urine collection bottle containing a preservative (50% acetic acid). Enclosed in the package were urine collection instructions that asked participants to thoroughly void, but not into the container, before going to bed the night before the laboratory tests. The container was to be used for any nighttime voiding and for the first morning void the next day. A follow-up telephone call before the laboratory day verified that participants understood the sampling instructions. Upon receipt of the urine sample in the laboratory, urine aliquots were frozen at −80°C and batched for analysis.

Urinary epinephrine assessments were conducted using high-performance liquid chromatography. The acidity of each urine sample was adjusted as necessary to achieve optimal extraction of constituents. Interassay and intra-assay variabilities (i.e., coefficients of variation) were 4%–7%. Epinephrine values below the detectable limit (0.05 ng/ml;

19 cases) were assigned a value of 0. Using a standardization method reported previously (Masi, Rickett, Hawkley, & Cacioppo, 2004), epinephrine levels were adjusted for creatinine concentrations that reflect hydration and urine volume differences. Creatinine concentrations, in turn, were corrected for muscle-mass differences that contribute to individual differences in creatinine production. Adjusted hormone levels used in analyses are expressed in ng/dl of urine, representing deviations of epinephrine concentrations from concentrations that would have been predicted on the basis of urine volume alone.

Self-rated health.—At each wave of data collection, self-rated health was assessed using a single item that asked subjects "In general, would you say your health is poor, fair, good, very good, or excellent?" Responses range from 1 to 5 with a higher value indicating better health. Self-rated health has high predictive validity for mortality, physical disability, chronic disease status, health behaviors, and health care utilization (Ferraro, Farmer, & Wybraniec, 1997; George, 2001; Idler & Benyamini, 1997); is highly correlated with, and is an even stronger predictor of mortality than, physician-rated health (Mossey & Shapiro, 1982).

Psychological measures.—We report on four measures of psychological well-being collected from the respondents at each wave of data collection. These four measures include hostility, perceived stress, loneliness, and depressive symptoms. Hostility was measured using the Cook-Medley Hostility Scale, a 50-item scale developed from the Minnesota Multiphasic Personality Inventory (Cook & Medley, 1954). For each item, the participant is asked to read the accompanying statement and indicate whether it applies to them by marking either true or false. Scores were computed by summing the responses after reverse coding the appropriate items. Scores range from 0 to 50, with higher scores indicating greater hostility.

Perceived stress was assessed using the 10-item Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, 1983), a self-report questionnaire in which participants are asked to indicate how often they felt or thought a certain way during the past week. Responses to each item are recorded using a 5-point Likert scale that ranges from 0 (*never*) to 4 (*very often*). Examples of questions included in the scale are "felt unable to control important things in your life," "felt difficulties were piling up so high that you could not overcome," and "felt stressed." Scores for each respondent were calculated by summing the responses to all items and can range from 0 to 40 with higher numbers indicating higher perceived stress.

Loneliness was measured using the R-UCLA Loneliness Scale (Russell, Peplau, & Cutrona, 1980), a 20-item questionnaire measuring general feelings of social isolation, loneliness, and dissatisfaction with one's social interactions. Respondents rated how often they felt the way described by the items on a scale ranging from 1 (*never*) to 4 (*often*).

Examples of items included in the questionnaire are "there is no one I can turn to" and "I feel alone," whereas examples of items that were reverse coded are "I feel part of a group of friends" and "there are people I can turn to." After reverse coding appropriate items, all of the items were summed to create a loneliness score (range = 20–80), with higher scores indicating greater loneliness.

Finally, depressive symptoms were assessed using the 20-item Center for Epidemiologic Studies Depression (Radloff, 1977). Respondents rated how often they felt the way described by each item during the past week on a scale of 0 (rarely or none of the time) to 3 (most or all of the time). Examples of items included in the scale include "I was bothered by things that don't usually bother me," "had trouble keeping my mind on what I was doing," and "felt everything was an effort." Examples of items that were reverse coded include "felt I was just as good as others" and "was happy." After items were reverse coded, the items were summed to create a continuous measure with higher values indicating higher levels of depressive symptoms (range = 0–60).

Independent Variables

Job insecurity.—To generate the relevant data about job insecurity, respondents completed a life events questionnaire in each of the follow-up surveys, indicating if any of several events happened to them in the past year. Respondents are classified as experiencing job insecurity if they indicated that (a) their employer reorganized or downsized or (b) that they were disciplined at work or demoted. We assign the respondents to four mutually exclusive groups reflecting men and women who do and do not experience job insecurity. Most instances (about 80%) of job insecurity for men reflect employer reorganization or downsizing as opposed to respondents' being disciplined at work or demoted. For women, approximately half of the instances of job insecurity reflect employer reorganization or downsizing.

Control variables.—All analyses control for several demographic characteristics of the respondent taken at the baseline survey. Control variables include the respondent's age measured in years, the respondent's race coded as White or non-White (non-White is omitted as the reference group), the respondent's marital status (not married is omitted), the respondent's educational attainment (at least some college is omitted), the respondent's work status (not working is omitted), and whether or not the respondent's total household income is less than $40,000 compared with the reference group whose household income is equal to or more than $40,000.

Analytic strategy.—Ordinary least squares regression was run for all continuous outcome measures. The analysis of self-assessed health status uses an ordered logit regression.

Table 1. Descriptive Statistics of Study Variables: Chicago Health, Aging, and Social Relations Study

	Total sample				Male sample				Female sample			
	Baseline		Follow-up		Baseline		Follow-up		Baseline		Follow-up	
	Mean or proportion	SD	Mean or proportion	SD	Mean or proportion	SD	Mean or proportion	SD	Mean or proportion	SD	Mean or proportion	SD
Job classification between baseline & follow-up												
Male job insecure	9%	—	—	—	18%	—	—	—	—	—	—	—
Male job secure	39%	—	—	—	81%	—	—	—	—	—	—	—
Female job insecure	12%	—	—	—	—	—	—	—	24%	—	—	—
Female job secure	40%	—	—	—	—	—	—	—	76%	—	—	—
Demographic characteristics												
Age	57.41	4.27	—	—	57.70	4.35	—	—	57.14	4.19	—	—
White	38%	—	—	—	38%	—	—	—	37%	—	—	—
Married	62%	—	—	—	76%	—	—	—	49%	—	—	—
No college	39%	—	—	—	43%	—	—	—	35%	—	—	—
Working	69%	—	—	—	69%	—	—	—	70%	—	—	—
Low income	34%	—	—	—	25%	—	—	—	42%	—	—	—
Physical health outcomes												
Blood pressure	129.31	18.34	128.96	17.61	130.51	16.4	131.38	16.89	128.22	19.95	126.99	18.07
Self-assessed health	3.30	0.90	3.35	0.86	3.34	0.93	3.44	0.86	3.26	0.88	3.28	0.86
Epinephrine	−10.81	80.60	−6.39	75.47	2.81	90.09	8.16	78.69	−23.28	68.79	−19.71	70.05
Psychological outcomes												
Hostility	16.79	7.5	16.40	7.71	19.01	7.65	18.58	7.28	14.66	6.73	14.32	7.13
Perceived stress	13.20	6.19	12.25	6.23	12.48	6.06	11.28	5.94	13.88	6.25	13.14	6.37
Loneliness	35.26	9.6	34.77	9.08	36.62	9.58	35.71	8.62	33.98	9.48	33.87	9.44
Depressive symptoms	9.59	9.6	9.13	7.89	8.74	7.52	8.35	6.73	10.37	8.76	9.86	8.79

Notes: Demographic characteristics reported for 190 respondents. Blood pressure, health, and hostility for 313 respondent-observations; epinephrine for 272 respondent-observations; perceived stress for 308 respondent-observations; loneliness for 324 respondent-observations; and depression for 322 respondent-observations. Demographic characteristics reported for 91 male respondents and job classification for 157 respondent-observations. Blood pressure reported for 150, health for 147, epinephrine for 130, hostility for 153, perceived stress for 148, loneliness for 157, and depressive symptoms for 155 respondent-observations. Demographic characteristics reported for 99 female respondents and job classification for 169 respondent-observations. Blood pressure reported for 163, health for 166, epinephrine for 142, hostility and perceived stress for 160, loneliness and depressive symptoms for 167 respondent-observations.

All models control for the respondents' baseline demographic characteristics, the baseline score on the outcome measure, and the set of job classification dummy variables (the reference group for this set of dummy variables is "men who do not experience job insecurity"). The standard errors are corrected (using the cluster option in STATA) in all analyses to account for multiple observations from one respondent (clustering on the respondent). Post-estimation comparison tests were conducted to identify statistically significant differences between the job classification categories included in the regression analyses; the significant findings from these tests are reported in notes to the Tables.

RESULTS

Sample Description

Table 1 presents the means and standard deviations of all variables in the analysis at the respondent level. Twenty-one percent of the sample experienced job insecurity and this experience is approximately equally represented among men and women.

The demographic characteristics are reported for 190 respondents. The respondents were 57.41 years of age on average at the start of the study. Thirty-eight percent are White and a majority of the sample was married (62%), had attended some college (61%), and was working at baseline (69%). Furthermore, 34% of the respondents reported a total household income of less than $40,000 per year.

Table 1 also presents the summary statistics of the respondents' physiological and psychological health measures. Descriptive statistics on baseline measures (used as controls in the analysis) as well as follow-up measures (the dependent variables in the regression models) are presented. The average blood pressure at both points in time is 129. On average, at both points in time, respondents rated their general health between "good" and "very good." Raw epinephrine values at baseline ranged from 0 to 4.51 ng/dl of urine (average of 0.99) and those at follow-up ranged from 0 to 8.52 ng/dl of urine (average of 1.35; raw data not presented in the Table).

The means and standard deviations for the psychological measures for the baseline and follow-up periods are also presented in Table 1. The average hostility, perceived stress, loneliness, and depressive symptoms are lower in the follow-up period compared with the baseline period (analysis of variance tests not shown). The descriptive statistics for men and women, presented in the last two panels of Table 1, suggest that men have significantly higher blood pressure, epinephrine levels, and levels of hostility compared with women (*t* tests not shown). However, men also have significantly lower levels of perceived stress (*t* tests not shown).

Table 2. Ordinary Least Squares and Ordered Logit Regression Analyses: Physical Health Outcomes

	Blood pressure		Self-assessed health		Epinephrine	
	B	SE	B	SE	B	SE
Male job insecure	5.22**	2.57	−0.90***	0.34	40.07*	22.68
Female job secure	−1.36	1.59	−0.12	0.24	−12.18	10.12
Female job insecure	−4.85	3.27	0.09	0.41	−17.92	13.62
Age	−0.11	0.19	−0.03	0.02	2.24*	1.15
White	−0.09	1.80	0.13	0.22	5.96	10.20
Married	1.37	1.64	−0.14	0.22	0.65	10.83
No college	−0.85	1.68	−0.90***	0.22	9.95	8.87
Working	0.27	1.91	0.23	0.24	−7.51	11.61
Low income	1.09	2.03	−0.66**	0.26	−9.30	10.54
Baseline outcome	0.55***	0.04	2.16***	0.24	0.15**	0.07
Constant	63.69***	11.98	—	—	−128.60*	68.08
Number of observations	313		313		272	
Model test statistic	19.68***		124.90***		2.71***	
R^2	0.36		0.30		0.11	

Notes: The coefficients for self-assessed health are from an ordered logit model. All other coefficients are from ordinary least squares regressions. Chi-square statistic and pseudo R^2 is reported for the ordered logit, F test and R^2 for ordinary least squares. Male job secure is omitted. Post-estimation differences suggest that women in both groups have lower blood pressure, better self-assessed health, and lower epinephrine compared with job insecure men.

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

Regression Analyses

Physical health–related measures.—Table 2 presents the regression results from the models for the two physiological measures and for self-rated health. The first column presents the regression coefficients for SBP. The findings suggest that men who experience job insecurity during the year between baseline and follow-up have SBP 5.22 points greater at follow-up (corresponding to an effect size of about one third of 1 *SD*) relative to men who do not experience job insecurity, holding baseline SBP constant. Post-estimation tests suggest that men who experience job insecurity show a greater change over time in blood pressure compared with women who experience job insecurity and women who do not. In contrast, women who experience job insecurity do not differ statistically on this measure from women who did not.

The second column presents the regression coefficients from the ordered logit model for self-assessed health. Findings suggest that men who experience job insecurity report poorer health compared with men who do not. Post-estimation tests suggest that men who experience job insecurity report poorer health compared with women who experience job insecurity and women who do not. In contrast, women who experience job insecurity are in no worse self-assessed health than women who do not.

Finally, the third column presents the findings from the regression model for the measure of residualized epinephrine. As with the previous two measures of physical health functioning, men who experience job insecurity experience a worse outcome on this measure compared with men who did not experience (an effect size of almost one half of 1 *SD*, albeit at the $p < .10$ level of statistical significance). As in the analysis of the other two measures of physical health, these men also have higher levels of epinephrine compared with women in both groups. In contrast, women who experience job insecurity have no higher levels of residualized epinephrine than other women.

Psychological measures.—Table 3 presents the findings from the regression models for the four measures of psychological well-being. The first column shows the findings for the regression model for hostility. Findings suggest (perhaps counterintuitively) that men who experience job insecurity have lower levels of hostility compared with men who do not. Females who do not experience job insecurity also have lower levels of hostility than their male counterparts who do not experience job insecurity. These differences are relatively modest—between 0.14 and 0.19 *SD*s. Post-estimation tests for gender differences indicate, however, that women who experience job insecurity have higher levels of hostility compared with men who experience job insecurity as well as women who do not.

The second column presents the findings for perceived stress. These findings show that women who experience job insecurity have greater perceived stress (on the order of 0.48 *SD*s) compared with men who do not experience job insecurity. These women also have greater perceived stress compared with men who experience job insecurity as well as women who do not. In contrast, men who experience job insecurity have no higher levels of perceived stress than men who do not.

The third column presents the regression coefficients for a model with loneliness as the outcome. Women who experience job insecurity have higher reported loneliness than men who do not experience job insecurity, a difference of 0.23 *SD*s. Post hoc estimation tests suggest that women who experience job insecurity report higher levels of loneliness compared with men who experience job insecurity as well as women who do not. In contrast, men who experience job

Table 3. Ordinary Least Squares Regression Analyses: Psychological Outcomes

	Hostility		Perceived stress		Loneliness		Depressive symptoms	
	B	*SE*	*B*	*SE*	*B*	*SE*	*B*	*SE*
Male job insecure	−1.46*	0.80	0.57	0.98	−0.20	0.98	0.38	1.04
Female job secure	−1.05*	0.59	0.93	0.72	−0.25	0.77	−0.01	0.71
Female job insecure	0.42	0.82	2.96***	0.96	2.06*	1.05	2.76**	1.23
Age	0.01	0.06	−0.17**	0.08	−0.06	0.08	−0.16**	0.08
White	−0.67	0.47	−1.21*	0.66	−0.64	0.63	−0.92	0.61
Married	0.42	0.50	1.32**	0.66	0.99	0.72	1.10	0.72
No college	0.67	0.56	0.40	0.62	0.94	0.67	0.81	0.62
Working	−0.16	0.55	0.16	0.80	−0.40	0.76	−0.88	0.91
Low income	−0.65	0.60	1.24	0.82	0.26	0.64	1.31	0.85
Baseline outcome	0.82***	0.03	0.44***	0.06	0.73***	0.05	0.57***	0.05
Constant	2.80	3.38	14.62	4.92	11.70**	5.05	11.85**	4.69
Number of observations	313		308		324		322	
F test	101.13***		13.39***		34.49***		18.36***	
R^2	0.69		0.29		0.63		0.44	

Note: Male job secure is omitted. Post-estimation differences suggest that female insecure has higher hostility, perceived stress, loneliness, and depressive symptoms than both male insecure and female secure.

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

insecurity have no higher levels of loneliness than men who do not.

Finally, the last column presents findings from models for depressive symptoms. Findings suggest that women who experience job insecurity hive higher depressive symptoms compared with men who do not experience job insecurity. Furthermore, women who experience job insecurity have higher depressive symptoms compared with men who experience job insecurity and women who do not. In contrast, men who experience job insecurity are not significantly different from other men on the measure of depressive symptoms.

Sensitivity Tests

We re-ran the regressions including controls for body mass index, blood pressure medication (both volume active medicines as well as vasoactive medicines including beta blockers), and controls for quantity and quality of sleep. Regression results (available upon request) were robust to inclusion of these measures and none of them were significantly associated with the outcomes of interest. The results were also robust to the inclusion of a set of three measures assessing the respondents' social network size and diversity (using Berkman's Social Network Index [Berkman & Syme, 1979] and Cohen's measures of network diversity and size [Cohen, Doyle, Skoner, Rabin, & Gwaltney, 1997]). Findings show no consistent pattern of associations between the job classifications considered here and any of these measures and, in particular, no associations that would suggest that job insecurity is associated with poor health outcomes via changes in the size or composition of social networks.

An additional concern is that those who are not working at baseline are not in fact looking for work or may never gain employment and thus are not at risk for job insecurity. If this were the case, the "not job insecure" group would include those who worked but whose jobs were not insecure as well as those who were not exposed to job insecurity by virtue of not working. Moreover, it could be the case that those who were not working at baseline but nevertheless experienced job insecurity during the follow-up period may be a unique type of worker who cycles in and out of jobs or selects into jobs where they are getting demoted or into a declining industry where others are being downsized. This highlights a potential concern about adverse unobserved selection and potentially spurious correlations with poor health outcomes. Because respondents included in the analysis do not include those who say they are retired, disabled, or a homemaker, those who are not working at baseline are considered to be actively seeking employment at baseline and thus desire to be in the labor force. To test whether including those not working at baseline influences the findings, we re-ran the models in Tables 2 and 3 on the subsample of men and women who are working at baseline. The coefficients of interest are presented in Table 4. In general, the size of the point estimates and the levels of statistical significance are comparable to those obtained in the bigger sample.

DISCUSSION

We contribute to the relatively underdeveloped literature on the employment challenges facing older workers by showing that job insecurity in this population is consistently associated with health and well-being. Prior work (Jensen & Slack, 2003; Rife, 1995; Slack & Jensen, 2008) has not only documented the widespread nature of employment challenges facing older workers but has also shown that older workers face considerably greater such challenges than their middle-aged counterparts. The individual and social costs of these challenges are not yet fully understood, but our work shows that the correlation between job insecurity and health could be clinically significant in several instances.

Table 4. Ordinary Least Squares Regression Analyses: Sensitivity Tests on Working at Baseline Sample

	Blood pressure		Self-assessed health		Epinephrine			
	B	SE	B	SE	B	SE	B	SE
Male job insecure	6.89***	2.59	−0.92**	0.40	40.43	25.09		
Female job secure	−1.84	1.98	0.14	0.28	−18.17	11.31		
Female job insecure	−4.86	3.38	0.36	0.41	−25.82*	15.27		

	Hostility		Perceived stress		Loneliness		Depressive symptoms	
Male job insecure	−1.52*	0.90	1.08	1.06	−0.66	0.79	0.03	1.23
Female job secure	−1.06	0.74	1.01	0.88	−0.37	0.75	−0.62	0.81
Female job insecure	0.36	0.88	3.19***	1.03	1.85*	1.00	1.94*	1.06

Note: The coefficients for self-assessed health are from an ordered logit model. All other coefficients are from ordinary least squares regressions.

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

For example, the average expected increase in SBP at this age is 1 point per year for men more than 50 years of age (Goldstein, Shapiro, & Guthrie, 2003): Our results suggested a 5-point increase in SBP over a 1-year period for men experiencing job insecurity. Moreover, given average baseline rates of 129 for men, a 5-point increase brings these men substantially closer to hypertensive SBP values (i.e., >130). Lewington, Clarke, Qizilbash, Peto, and Collins (2002) found that each difference of 20 mm Hg SBP in 40- to 69-year-olds was associated with a twofold increase in stroke death rate and that this effect operates in a linear fashion. Similarly, for women, job insecurity was associated with a substantially increased risk of depressive symptoms, which could have significant individual and social costs (Kessler, McGonagle, Swartz, Blazer, & Nelson, 1993).

Second, we show that job insecurity is not associated with health outcomes for all individuals uniformly; rather, our results illustrate a gender-specific pattern of correlations that coincides with existing hypotheses about gender-specific responses to stress in general. Our inclusion of a broad range of outcome variables helps to support the conclusion, similar to the one reached by Ferrie and colleagues (1995), that changes in reported physical health in response to job insecurity are larger for men, but that changes in psychological health are larger for women. Our findings extend those of Ferrie and colleagues (1995) by focusing on a sample of older workers. Importantly, our work fails to support the hypothesis that job insecurity is correlated with health outcomes in men only (perhaps because of persistent social expectations about men's breadwinner roles). Rather, our results show that job insecurity is associated with health outcomes differently in men and women, but to a potentially clinically significant degree in both populations.

Despite these contributions, there are a number of limitations of the present study. For example, more information on the nature of the workplace environment could help elucidate the pattern of sex-specific correlations between job insecurity and health. When others in the workplace are fired or laid off, how do the remaining men and women respond? Do men become angry or aggressive, and is this reflected in their higher levels of physiological responses? Do women ruminate on others' plight or are they distressed by the disruption of work-based emotional ties, and is this reflected in their higher rates of depression and loneliness? In-depth qualitative work would go a long way toward answering such questions.

The definition of job insecurity employed here reflected arguably objective circumstances that were occurring at the workplace, rather than commonly used measures of subjectively perceived job insecurity. This helps to support a causal interpretation of these associations, as does our strategy of controlling for baseline measures of the outcomes. However, a limitation of the available measures is that we do not know the number of people who were fired or laid off or demoted at respondents' workplaces nor do we know about the severity of the disciplinary action or demotion at the respondents' work. The pattern of associations would likely be stronger in face of a major than a minor downsizing (Kivimaki et al., 2000) or in the face of substantial downgrading of workers' status. We also do not know how work conditions change as a firm downsizes nor do we know the mechanisms that produce these effects. If employers are reorganizing or downsizing, it is possible that the negative health effects we observe could reflect increased workload and not job insecurity. Moreover, workplace policies vary significantly by occupation and, in some cases, disciplinary action at work (an element of our measure of job insecurity) may not be especially salient.

Another concern related to possible bias in the results would be if unhealthy people select into jobs or industries that are more prone to downsizing, but this is probably less of a concern in the current era where the phenomenon of layoffs is widespread and cuts across socioeconomic lines. In addition, we do not know if the sex differences apparent here reflect differences in the jobs men and women hold or whether the correlations for men and women would differ based on their status as secondary versus primary earners. Although our data do not provide this information, such questions are important for future work to pursue. The results presented here are also potentially biased due to selective mortality and institutionalization. In addition, a form of "left censoring" may be present in that some sample

members may have experienced long durations of job insecurity over midlife, or an even greater episode of job-related concern just prior to the "past year" baseline exposure in the initial wave, and it could be that these prior exposures are associated with health. Finally, the sample size is relatively small and may lack the statistical power to detect small effects.

The obvious next steps in this line of work are to identify the behaviors or events that link job insecurity to poor health in older men and women. As additional waves of the data become available, we will be able to test whether linkages between job insecurity and health are mediated and moderated by respondents' financial status (e.g., level of wealth, savings, and other preparations for retirement) or worries. The present results, nevertheless, raise important concerns about the health and well-being of older workers. To the extent that job insecurity becomes ever more prevalent, its negative health correlates among preretirement men and women already at elevated risk for health problems (relative to their prime-age peers) portends increasingly difficult transitions to retirement and beyond for the aging U.S. population.

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