Job Loss and Health among Men and Women in the United States*

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INTRODUCTION

Multiple areas of research within sociology and social epidemiology have generated evidence that health is strongly patterned by an individual's social position (House et al. 1994; Link and Phelan 1995; Marmot, Kogevina and Elston 1987; Muntaner et al. 2004; Williams and Collins 1995). Explanations for a relationship between health and social position have taken two main forms: the social causation explanation suggests that social environmental conditions and experiences linked to social position shape an individual's health, while the social selection explanation suggests that people with health deficits have problems achieving and maintaining higher social status. It is increasingly accepted, however, that taking an either/or approach to causation and selection effects when studying social position and health is overly simplistic, as both can be at work in complex feedback relationships that span the life course (Bartley 1994; Bartley, Ferrie and Montgomery 1999; Korpi 2001; Vagero and Illsley 1995; Valkonen and Martikainen 1995). In this paper we comprehensively examine the reciprocal causal relationships between health and involuntary job loss, an event that marks an acute drop in social position and has potentially serious implications for future health.

An involuntary job loss may have major social and economic consequences that could damage physical and mental health, most centrally the loss of a major social role (Hayes and Nutman 1981; Jahoda 1982) and a shock to the earnings stream (Kessler, House and Turner 1987). There has been only limited empirical examination of the predictors and consequences of involuntary job loss, but a large body of evidence shows that working-age people who are not economically active have significantly poorer health than their counterparts working for pay (for a review, see Dooley, Fielding and Levi 1996). Research on employment status and health has demonstrated support for social causation as an explanation for the relationship; among people

capable of working, the experience of unemployment has substantial effects on physical and mental health (Turner 1995). There is also evidence that processes of social selection underlie the relationship; people in poor health may be more likely to lose a job or less likely to find one, if they are searching for work (McDonough and Amick III 2001). However, many studies of employment status and health focus on the differences between unemployed and employed populations and are unable to disentangle the contributions of social causation and selection for at least two reasons. First, there is considerable heterogeneity in the unemployed population, which includes people who were formerly working but lost a job, as well as those who were never successful in entering the labor market at all; these groups could differ substantially in social position and health, or in the way these are related. Second, many analyses suffer from difficulties establishing the temporal ordering of job loss (or failure to enter work) and health decline, because of significant data requirements: multiple measures of health and social position over time.

One way to sort out the reciprocal relationships between social position and health is to observe employed people and focus on the event of involuntary job loss itself, a sharp negative change in employment status that leads to a period of unemployment, a new job, or exit from the labor force. There have been many studies of the predictors of involuntary job loss, and a smaller number that examine the health consequences of such a loss, but studies that consider both the precipitating factors (social selection) that determine who loses a job involuntarily, as well as the consequences of job loss for health (social causation) are rare (but see Korpi 2001). In the present analysis, we focus on these interacting processes of social causation and selection during the working years, a period in the life course when the connection between social position and health is strong, but one that has been understudied because of the difficulties associated with

establishing the directionality of causation between health and events like job loss (Herd et al. 2004).

How Does Job Loss Affect Health?

Several research traditions have contributed to our understanding of the way a job loss could affect subsequent health. Sociological study of the impact of stressful life events suggests that there are physical and psychological health consequences of stressful life events like unemployment or job loss (Kasl and Jones 2000; Theorell 1982). However, much of the current research in the area of social stressors and health focuses on the longer-term effects that arise as a consequence of "acute" events.[1] According to this perspective, an event like involuntary job loss is the precipitating or central factor, but the stress process itself is more chronic (House 1987; Pearlin et al. 1981). Research in social stratification and labor economics has explored the consequences of 'trigger events,' such as labor market transitions, for a household's future income trajectory and social mobility (DiPrete and McManus 2000). An involuntary job loss typically entails a major loss of income and increased financial strain (Kessler, House and Turner 1987) that may have lasting effects on long-term earning potential (Jacobson, LaLonde and Sullivan 1993), and could reduce an individual's ability to purchase health promoting goods. Losing a job may also have indirect economic consequences, such as the loss of health insurance coverage, pension and other benefits. Other mechanisms connecting job loss with accumulating health deficits focus on the loss of psychosocial assets including goal and meaning in life, social

[1] A related body of research examines the potential impact of differential vulnerability to the stresses and strains associated with a life event such as job loss (Kessler, House and Turner 1987). For example, there is some evidence that people of lower socioeconomic standing may be more vulnerable to health impacts of involuntary job loss because they have fewer financial resources to make up for the earnings loss; however, individuals of higher socioeconomic position may have greater employment commitment, exacerbating the emotional impact of the job loss (Turner 1995). The data sources used in the present analysis do not include measures of employment commitment, so we do not engage the issue of differential vulnerability.

support, sense of control, and time structure (Jahoda 1982; Pearlin, Lieberman, Menaghan, and Mullen 1981).

Most of the evidence for a negative relationship between job loss and health comes indirectly, from studies of unemployment. Unemployment can represent the end result of a job loss, or the failure to find a job when an individual has entered the labor market. Unemployment has been linked to physical health outcomes ranging from self-reported physical illness (Kessler, House and Turner 1987) to mortality from suicide (Platt 1984), and to mental health consequences including increased depressive symptoms (Dooley, Catalano and Wilson 1994) and reduced self-reported well-being (Laheima 1989). Unemployment has also been shown to increase the use of tobacco and alcohol (Dooley, Catalano and Hough 1992; Lee et al. 1991; Montgomery et al. 1998), which could impact physical health in the long term. Nonetheless, many of the studies proposing that unemployment leads to poorer health outcomes are subject to the critique that some proportion of the unemployed population suffers from health or social deficits that both labor force entry and explain poorer subsequent health outcomes.

Much of the more limited evidence for health effects of the acute job loss experience comes from factory closure studies (e.g., Kasl, Gore and Cobb 1975), because under such conditions it is less likely that specific characteristics of a particular worker are responsible for job loss. Some of these original studies appear to show that anticipation of plant closure and adjustment to a new job, once found, are linked to days ill, rather than the experience of the loss itself. One study found that physician consultations, illness episodes and hospital referrals and attendance all increased among men who had lost a job compared to those who did not, but the same relationship was not found among women (Beal and Nethercott 1987). A more recent plant closure study found an increased risk of mental distress leading to serious self-harm (Keefe et al.

2002). Other longitudinal studies of adults have also shown that becoming unemployed is associated with a worsening of psychological symptoms such as depression, somatization, and anxiety (Dooley, Catalano and Wilson 1994; Linn, Sandifer and Stein 1985), and increased alcohol consumption (Catalano et al. 1993; Gallo et al. 2001). However, the limited evidence for heath behavioral effects of job loss is not always consistent; for example, other longitudinal findings suggest that alcohol use may decrease with a job loss (Iversen and Klausen 1986), or that there may be no change in drinking behavior (Broman et al. 1995).

Restriction of the study population to people who are employed means that the findings of existing job loss studies are not as vulnerable to the critique that some unemployed people have health problems that both prevent them from working and explain their poorer subsequent health. However, there are remaining shortcomings in the existing studies of job loss and health. First, study populations have not represented the U.S. workforce; many of the existing analyses of job loss and health have used samples from a single factory, geographical area, or occupational group. As a result, many studies have not been able to examine the health consequences for men and women across the occupational spectrum. Second, even studies using longitudinal data have had limited controls for social selection, both on the basis of social and economic background and health status.

How Do Social and Health Selection affect the risk of Job Loss?

The health selection hypothesis suggests that much of the correlation between health and being or remaining employed is created because healthy people are selected into the labor force and unhealthy people face barriers to entry or have greater likelihood of involuntary exit (Arrow 1996; McDonough and Amick III 2001; Repetti, Matthews and Waldron 1989). This is also called the "healthy worker effect," and much of the evidence for the position has come from

studies of unemployment, rather than analyses focusing on the job loss event. Unemployment studies have shown physical and mental health predate unemployment (Ferrie 1997; Klein-Hesselink and Spruit 1992; Leino-Arjas et al. 1999). In addition, health behaviors such as heavy drinking are predictive of future job loss (Catalano et al. 1993).

Among the limited number of studies focusing specifically on the way that health influences changes in employment status, there is evidence that among housewives in the USA and Sweden and adults in Sweden, healthy people are more likely to enter employment, while those in poor health are more likely to leave employment (Korpi 2001; Vagero and Lahelma 1996; Waldron 1980). One study showed that Norwegian respondents with psychological health problems were more likely to be laid off and those with psychological or physical health problems were less likely to be reemployed (Mastekaasa 1996). One of the major shortcomings in the research on the effects of health on involuntary job loss is the limited number of studies on the topic; among the existing studies, the quality of available measures of health varies, many do not have extensive controls for social and family background characteristics, and almost none also consider the health consequences of involuntary job loss.

Focus of Study

In the present analysis we are interested in exploring the causal relationship between an involuntary job loss and subsequent physical and mental health and health behavior, examining the social selection factors that increase an individual's risk for involuntary job loss, and understanding the way that these forces interact during the adult working life to influence future health. In response to the gaps in the prior research on involuntary job loss and health, we explore several research questions:

1. *Is an involuntary job loss associated with poorer subsequent health*? We will replicate the kind of work done in earlier studies on the consequences of unemployment and job loss, expanding on existing knowledge by considering multiple health outcomes among men and women, using two distinct longitudinal population-based surveys (one nationally-representative and the other more localized) with long periods of follow-up.
2. *Is the risk of involuntary job loss greater for individuals in worse health, those of lower social position and those with less desirable working conditions*? We are able to explore the impact of an extensive set of health measures, social and family background characteristics, and working conditions as predictors of involuntary job loss, considerably exceeding the set of characteristics typically available.
3. *Does the health impact of an involuntary job loss persist when we apply various controls for social selection*? In our models of health, we are able to adjust for the impact of social selection with an extensive set of health and social background measures. In addition, we also have access to information on the reasons for involuntary job loss (including an indicator of loss for health reasons), and the timing of job loss events and health shocks. Using these data, we can identify individuals for whom health-based selection clearly explains the relationship between a job loss and later health; by omitting these individuals from the analytic sample, we can considerably reduce the possibility that our findings are driven by social selection, rather than social causation.

DATA AND METHODS

We use two complementary data sources to explore our hypotheses. The American's Changing Lives study (ACL) is a longitudinal cohort comprised of a stratified, multi-stage area probability sample of non-institutionalized adults 25 years and older living in the United States in 1986, with

oversampling of adults 60 and older and of African Americans. Weights have been designed to make the ACL respondents representative of the non-institutionalized population in the contiguous United States in 1986. In the baseline survey in 1986, face-to-face interviews were conducted with 3,617 men and women (representing 70% of sampled households and 68% of sampled individuals), and these individuals were followed up with subsequent waves of data collection in 1989, 1994 and 2001/2. At each wave of data collection, respondents reported on their current health and were also asked about the occurrence and timing of an involuntary job loss or any serious health events in the several years prior to interview. Further information about the longitudinal study design for the ACL can be found elsewhere (House et al. 1990; House et al. 1994).

We also use data from the Wisconsin Longitudinal Study (WLS). The WLS began as a long-term study of a random sample of 10,317 men and women who graduated from Wisconsin high schools in 1957. Data were collected from parents of the graduates in 1964 and from the graduates themselves in 1975; tax data were obtained in 1965 from WLS parents and respondents. In 1975 and again 1992/3, telephone and mail surveys were conducted of the original 1957 respondents. These data provide a full record of social background, youthful aspirations, schooling, military service, family formation, labor market experiences, and social participation of the original respondents. The WLS has enjoyed remarkably high rates of response and sample retention. In 1964 and in 1975, the WLS had response rates of 87% and 89%, respectively (Sewell et al. 2001). In the 1992/3 round of data collection, the content was extended to obtain detailed occupational histories and extensive information about mental and physical health and well-being. Occurrence and timing of job losses between 1975 and 1992/3 was collected, as well as detailed information about the reason for job loss. Out of 9,741

survivors of the original sample, 87% completed telephone interviews in 1992, 35 years after the initial data collection. Mail survey response, conditional on completed telephone interviews, was about 80%.[2]

By utilizing the unique strengths of each of these datasets, we can obtain a fuller picture of the relationship between involuntary job loss and health. We can also explore the possible impact of limitations unique to each data source. For example, the ACL did not collect complete occupational histories from respondents, and does not include family background information that would be useful for exploring the effects of intergenerational transmission of advantage. Furthermore, the ACL was designed to represent the adult population, so includes a relatively small number of individuals at any given age. The WLS is a true cohort of high school graduates, so all respondents are nearly the same age and are followed through the entirety of their early working lives into middle-age. However, everyone in the WLS is a high school graduate and there were only a handful of racial/ethnic minority individuals in the sample, due to the demographic composition of Wisconsin in 1957. Furthermore, information about health was collected only in 1992/3, preventing us from controlling for health prior to an involuntary job loss. The ACL is a nationally-representative sample that includes individuals at all levels of completed education and covers the whole United States population, as well as providing the opportunity to explore issues of health-based selection into insecure working conditions. Finally, comparison of results obtained using two distinct samples will aid in assessing the robustness of our findings.

Measures

[2] WLS project leaders conducted a new round of surveys in 2003-2005 of the surviving original cohort members and their randomly selected siblings; members of the original graduate sample were 64-66 years old when they were surveyed.

Descriptive figures for all measures used in the analysis are presented in Table 1 for the ACL and WLS, separately for women and men and by job loss history. Descriptive figures are presented as means and standard deviations (in parentheses), or percentages where appropriate. Measures common to both data sets are presented in the top panel of Table 1, while those specific to one data set appear below. Descriptive figures are means and standard deviations (in parentheses), or percentages where appropriate. Most of the predictor variables presented in Table 1 for the ACL were collected at baseline in 1986, while health outcome measures presented in this table were collected in the 2001/2 wave.[3] Measures for the WLS were collected mainly in 1975, while the health outcome measures refer to health in 1992/93.[4] All figures presented in Table 1 are weighted estimates, while column totals are unweighted.

Health outcomes

We use two health measures, one for physical and one for mental health, to compare the effects of an involuntary job loss on different measures of overall well-being. Self-reports of overall health and depressive symptoms were collected at each wave from ACL respondents and in 1992/3 for WLS respondents. Respondents were asked to rate their overall health at the time of the survey with the typical five item scale for self-rated health, with values ranging from excellent (1) to poor (5). In the ACL, average self-rated health scores in 2001/2 range from 2.3 for workers who lost a job to 2.5 for workers who did not lose a job, reflecting a score between "very good" and "good" overall health in 2001/2. WLS respondents have average self-rated health scores of 1.8 for workers who lost a job to 2.0 for workers that did not lose a job, ranging from "excellent" to "very good" and slightly better that those reported by ACL respondents,

[3] We present health outcome measures for eligible respondents in the 2001/2 wave of the ACL survey and predictors from baseline, but health outcome measures and predictor variables from 1989 and 1994 are also considered in the data management strategy outlined below.

[4] Some of the non-health measures were retrospective reports actually collected from respondents in 1992/3, but pertain to a respondent's first job spell over the period 1975-1992.

partially reflecting their younger average age at the end of observation (about 53 versus 57 years, figures not shown). Psychological distress is measured in both studies using the Center for Epidemiological Studies Depression Scale or CES-D (Radloff 1977). The full 20-item scale is used for the WLS, while an 11-item subset of the complete scale is used for the ACL; Kohout and colleagues (1993) demonstrated that this subset had similar reliability when compared to the full scale. In the ACL, responses to each item are scored on a four-item Likert scale, then all items are summed and the score is standardized based on the total ACL sample, with a final range from -1.2 (least) to 4.7 (most depressed).[5] ACL respondents in 2001/2 reported average CES-D scores of -0.37 for workers that did not lose a job to -0.16 for workers that lost a job. In the WLS, the scoring of individual CES-D index items is based on a count of the number of days in the last week (0-7) that the respondent felt as indicated in each of the twenty questions; items are summed for a total range of scores from 0 (least) to 140 (most depressed), and the natural logarithm of this index is used here to reduce skewness (final range 0 to 4.8). WLS respondents reported average CES-D scores of 2.4 for workers that did not lose a job to 2.7 for workers that lost a job.

Involuntary job loss

At each wave of the ACL, all respondents were asked whether they had an involuntarily job loss for reasons other than retirement since the last wave of the survey to which they had responded (or in the last three years, in the baseline survey). Using these data, we created up to three person-spell records per respondent; the first possible spell (1986-1989) contains information about health in 1986 and in 1989, sociodemographic characteristics measured in 1986, and a measure of whether the respondent involuntarily lost a job between 1986 and 1989. The second

[5] Standardizing is performed at each wave based on the distribution for the entire sample in at baseline, so that comparison of scores across waves of the survey is not compromised by sample attrition or mortality.

and third spells capture the same information for the 1989-1994 and 1994-2001/2 periods. Using these data it is possible to assess the impact of an involuntary job loss, retrospectively reported at a given wave, on health status at that same wave, while adjusting for the individual's health and socioeconomic position at an earlier wave. In the 1992/93 wave of the WLS a detailed employment history was collected from respondents, who were asked about termination of employment spells between 1975 and 1992/3. One person-spell was constructed for each respondent, measuring health in 1992/93, background factors in 1957, 1964, and 1975, an indicator of whether there was an involuntary job loss any time between 1975 and 1992, and the reason for the loss.[6] Involuntary job loss is more explicitly defined in the WLS as the termination of an employment spell due to plant closing, downsizing, relocating; "other involuntary termination (help no longer needed)"; temporary or seasonal lay-off; health-related reasons; business failure; or imprisonment.

Controls

Indicators of the respondent's age and race (Black or non-Black) are included in all models using the ACL sample, to increase comparability with the population sampled for the WLS.[7] Variables correlated with both health and involuntary job loss are also included in the analyses, including measures of educational attainment (years of completed schooling), respondent's annual earnings (adjusted to 2004 dollars), marital status (currently married or not), whether the respondent works for a private or public employer, a measure of occupational standing (a started log transformation of the occupational education score for the respondent's three-digit census occupation code) (Hauser and Warren 1997), and an indicator of whether the respondent worked

[6] For the approximately 10% of individuals who had more than one involuntary loss over this period, we considered the reason associated with the first loss.

[7] There were not enough respondents of other racial/ethnic backgrounds in the ACL sample to construct additional race categories for the analysis, because the ACL was constructed to represent the 1986 United States population, when the proportions of other racial/ethnic minority groups were lower than today.

in a goods-producing industry (manufacturing, mining or construction) or not. Taken together, these sociodemographic and work characteristics provide a basic outline of the respondent's adult social position. We expect that individuals with higher social position, indicated by greater educational attainment, higher earnings, and higher occupational standing, will be less likely to experience an involuntary job loss and will report better health than their counterparts with less schooling, lower earnings, and lower occupational standing. Married people may be less likely to experience involuntary job loss than unmarried people. The risk of an involuntary job loss is likely to be greater for private employees and in goods-producing industries than for people who work in public employment or self-employment and those who work in other industries.

Further controls for social background utilized in models estimated for WLS respondents include: respondent's mother's schooling (years, measured in 1957), head of household's occupational status (coded using Duncan 1970 SEI score, measured in 1957), parents' income (truncated at $99,800 and transformed with a started log function, measured in 1957), respondent's mental ability (Henmon-Nelson 11th grade IQ score), respondent's labor force experience in 1975 (proportion of time between 1957 and 1975 not known to be out of the civilian labor force), respondent's employer tenure (years with current employer, as of 1975), respondent's pension status (whether in first job spell (1975-1992) employer offered pension/retirement plan), and respondent's union membership status (indicator of membership in a labor union in first job spell 1975-1992).

Analytic Strategy

We restrict the ACL analytic sample to respondents who were interviewed for the 1989, 1994, and/or 2001/2 surveys (3,118 cases), were working for pay in 1986, 1989, and/or 1994, the baseline year for a given person-spell (2,108 cases), and were not missing information on

involuntary job loss experience, health, or other key covariates (1,778 cases).[8] Among these respondents, there were 138 involuntary job losses in the 1986-1989 period, 130 in the 1989-1994 period, and 129 in the 1994-2001/2 period.[9] Using the WLS data, we restrict our analysis to respondents who were interviewed for the 1992/93 survey (8,327 cases), worked at a paid job for six months or longer during the period 1975-1992 (7,972 cases), and were not missing information about the reason for an employment spell termination or other covariates used in the analyses (7,330 cases). In the analytic sample for the WLS, 1,666 respondents (23%) reported an involuntary job loss at some time between 1975 and 1992/3.

Some studies have found that patterns of selection and causation related to work and health differ for men and women. The common prediction is that women would be more reactive to poor health, i.e. be more likely to leave work in the presence of poor health, because they have greater discretion over their labor supply (Ruhm 1992) and because joblessness is not a 'proscribed state' for women (Stolzenberg 2001). However, the few studies that examine gender contingencies in health selection produce mixed results (McDonough and Amick III 2001); some found that men were more likely than women to leave the labor force in the presence of poor

[8] Some of the losses due to missing information were for individuals who died between waves (N=58) or were lost to follow-up (N=272). Measures were imputed for observations of annual earnings (6.9%) and occupational standing (2.98%) if a respondent was working at the outset of a person-spell of observation but did not answer these questions. Indicators for private employer (1.65%) and/or goods-producing industry (5.06%) were assigned when missing for a given person-spell based on the values for earlier or later spells, and where other information was not available, respondents were assigned to public employer and non-goods-producing industry. Dichotomous variables indicating missing data on these measures were created and included in all analytic models, though the estimated coefficients or odds ratios associated with these indicators are not reported.

[9] To estimate a set of comparable models across both samples, person-spells from the ACL were included in the main analysis when the respondent reported working in the paid labor force in the baseline year for a particular spell (e.g., in 1986, 1989, or 1994), so that we had information on their working conditions at the baseline for each period of observation. However, some respondents entered work after the baseline year for a particular spell and were at risk for an involuntary job loss for that spell, but these person-spells are omitted from the main analysis. Between 11% (n = 26, 1994-2001/2) and 19% (n = 35, 1986-1989) of the involuntary job losses in a given spell occurred among individuals who did not report working in the baseline year of that person-spell. To assess the impact of omitting these losses from consideration, we estimated a set of models parallel to those used in the main analysis, but omitting job characteristics and including all individuals who reported working in any of the survey years. These results are reported are discussed below.

health or disability (Belgrave, Haug and Gomez-Bellenge 1987; Loprest, Rupp and Sandell 1995), while others found that women were more likely than men to leave work (Chirikos and Nestel 1984; Mullahy and Sindelar 1990). There is also evidence that effects do not vary much by sex (van de Mheen et al. 1999). Turning to the evidence for sex differences in causation effects, a study using American twin pairs found only very limited evidence that men were more sensitive to the depressive effects of a job loss (Kendler, Thornton and Prescott 2001), and a study of Swedish respondents found that the effects of past unemployment on mortality were, if anything, slightly stronger among women than men (Nylen, Voss and Floderus 2001). In the present analysis we estimate models using pooled samples that contain men and women, adding appropriate interaction terms between respondent's sex and relevant predictor variables. In exploratory analyses not reported here, we examined models estimated separately by sex and found that either specification produces substantively equivalent results.[10] We discuss relevant sex differences in the text below.

Throughout the analysis, we estimate models separately for the ACL and WLS samples because they contain unique predictors and some measures are coded differently. To make the results comparable to those using the nearly all-white and same-age respondents in the WLS, all models using the ACL sample adjust for respondent's age at baseline and race.[11] Using the pooled person-spell ACL sample, we estimate general linear models using generalized estimating equations (GEE). GEE models adjust for the bias introduced by the correlation between repeated measures of observed covariates and outcomes for the same subject over time (Hannan and

[10] Results by sex are available from the authors upon request.

[11] We also include indicator variables for the person-spell under observation (1986-1989, 1989-1994, or 1994-2001), and whether the respondent ever died over follow-up, to appropriately use the GEE modeling strategy with the person-spell data file. The indicator of mortality at some time over follow-up adjusts for the differential selection mechanisms that may be associated with mortality and survey non-response. The use of the "stacked" person-spell observations makes full use of all information for respondents who eventually left the study, prior to or following the survey wave at which they did not did not respond.

Young 1977; Zeger and Liang 1986; Zeger and Liang 1992). GEE models treat this correlation as a nuisance parameter by estimating a within-subject correlation separately from the regression parameters, resulting in consistent estimates of the regression coefficients without the necessity of strong assumptions about the actual structure of the correlation. In analyses with the ACL sample, we model self-rated health and psychological distress as continuous outcomes, using the Gaussian distribution and an identity link function, and specify an independent correlation structure. For models of involuntary job loss, a dichotomous outcome, we use a binomial distribution with a logit link, and specify an exchangeable correlation structure. The WLS respondents contribute only one observation to the analytic sample, so we estimate logistic regression models of involuntary job loss and OLS multiple regression models of self-rated health and psychological distress.[12]

Basic Models

Our analysis consists of two stages: in the first, we explore the relationship between involuntary job loss and health with models that are typically used to test for social causation or social selection. In the second stage, we extend these basic models by incorporating a series of extensive adjustments for selection on the basis of health or social background into models that predict health outcomes as a consequence of involuntary job loss. To begin the first part of the analysis, in Model 1 we assess the overall impact of an involuntary job loss on subsequent health by regressing current health on an indicator for a past involuntary job loss. To explicitly model selection processes that might provide an alternate explanation for the relationship between job loss and subsequent health, in Model 2 we predict the odds of involuntary job loss as a function of sociodemographic characteristics of the individual and his or her working conditions. Then, in

[12] We also estimated ordered probit models for self-assessed overall health, but as the results were substantively the same as those obtained using OLS regression; we report the OLS regression results here for consistency with the other outcome.

Model 3 we adjust our estimates of the causal effect of involuntary job loss on health from Model 1 for the effects of selection on the basis of these sociodemographic and work characteristics. This first stage of the analysis will produce results comparable to those obtained in many previous studies, and these results can be compared across the ACL and WLS samples to show how consistent the relationships between health and involuntary job loss may be.

Controls for Selection

The next stage of the analysis extends upon previous studies, building on the unique strengths of our data sources. The additions and permutations in these next models all address potential ways that social selection may influence the relationship between job loss and subsequent health, and can be used to assess the robustness of the results obtained in our basic models and in other studies for which extensive controls for selection are not possible. First, we address the possibility that the relationships we observe between job loss and health are due to the selection of unhealthy people into work that carries a greater likelihood of an involuntary job loss. In Model 4, we include ACL respondents' reported self-rated health and psychological distress at the baseline of the person-spell and assess whether health affects the subsequent risk of an involuntary job loss, above and beyond the effects of the sociodemographic predictors in Model 2. Similarly, Model 5 predicts self-rated health or psychological distress at the end of a person-spell, adjusting for the respondent's report of their health at the baseline of that spell. In other words, we can assess the *change* in health between the baseline year of the person-spell and the ending year that is associated with an involuntary job loss. While the WLS does not include information on baseline health, we utilize the extensive high-quality social background measures, cognitive ability, and early labor market experiences to further adjust our estimates for possible social selection bias. Family background, IQ and early working conditions could be

responsible for the respondent's access to stable occupational opportunities in Model 4, which predicts the likelihood of involuntary job loss. In Model 5, we test whether these factors account for current self-rated overall health or psychological distress, either working independently or through their effect on the risk of involuntary job loss. In other words, Model 4 assesses whether characteristics that influence the risk of involuntary job loss include variables that have often been absent in previous studies; Model 5 tests whether these characteristics may be correlated with future health, and therefore bias estimates of job loss on health that fail to include such variables.

Reasons for Involuntary Job Loss

In addition to these ways of assessing the impact of social selection, using WLS data we are able to go beyond past analyses that have relied on an undifferentiated indicator of any form of involuntary job loss. Instead, using the respondent's report of the specific reason for job termination, we are able to examine and compare the impact of different circumstances of involuntary job loss, including displacement (N = 1,071), fire or lay-off (N = 286), health-related reasons (N = 339), temporary or seasonal lay-off (N = 90), and business failure (N = 35). Presumably, different mechanisms of selection may be operating under each of these conditions. For example, workers generally are displaced because of macroeconomic factors not under their direct control, while a firing may be on the basis of selection factors such as personal or socioeconomic characteristics. Furthermore, experiencing a displacement may have very different effects on mental and physical health than being fired. Moreover, clearly, current health will be influenced heavily by job loss for health-related reasons. Using the information on the cause of job loss, with Model 6 we predict self-rated health and psychological distress with indicators for each of these reasons for job loss (with no job loss as the comparison category),

and compare their relative impact. With Model 7, we assess the impact of an involuntary job loss on self-rated health or psychological distress, omitting respondents who report losing their job for health reasons. Workers who report losing a job for health reasons likely did so involuntarily, but when assessing their later health it is not possible, given these data, to separate the effect of the involuntary job separation with the effect of health problems that existed prior to the job separation. By removing all cases where health problems clearly precipitated a job loss, our estimates of the impact of an involuntary job loss on subsequent health are less vulnerable to the influence of health selection.

Temporal Ordering of Involuntary Job Loss and Health Shocks

Unique measures from the ACL allow us to identify cases where an involuntary job loss was likely to be the result of an acute health crisis. At each ACL survey wave respondents were asked whether and when they had experienced a range of life events (in addition to an involuntary job loss), including experiencing a serious and/or life-threatening health event.[13] Because we know the year (and in most cases, the month) of the job loss event and the health event, we are able to create a typology of the ordering of events within person-spells: no involuntary job loss and no health shock (N=2,679), a job loss but no health shock (N=237), a health shock but no job loss (N=811), a health shock clearly preceding a job loss or a health shock and job loss occurring in the same month (N=54), a job loss clearly preceding a health shock (N=41), and cases where both involuntary job loss and a health shock occurred, but the ordering of events is not distinguishable due to missing information (N=35). Using this information on the ordering of events in the ACL, we estimate a set of models to complement those that use information on the reported reason for job loss in the WLS. In Model 8, we modify Model 3 by substituting the

[13] The definition of a "serious" or "life-threatening" life event was left up to the respondent, so there may be some variation in the objective severity of the event, but in the present analysis we assume that any reported event could potentially impact an individual's ability to continue at her present paid job.

categorical typology of the ordering of job loss and health events for our original single indicator of involuntary job loss (with no involuntary job loss, no health shock as the comparison category). Then, with Model 9 we reestimate our original Model 3 (with the single indicator of involuntary job loss), but omit all person-spells for which a health event clearly preceded or was coincident with the job loss. As a final check on the robustness of our results to health selection, in Model 10 we reestimate Model 3 for the ACL respondents, this time omitting any respondent who reported a health event at any time in the person-spell. Individuals may mistakenly report the dates of events, and such errors could increase with the time since the events occurred. It may also be the case that the health condition precipitating the serious or life-threatening health event affected the respondent's risk of job loss prior to the acute health event. Again, by removing the cases where an acute health event clearly precipitated or accompanied a job loss, we purge our estimates of the impact of an involuntary job loss on subsequent health of health selection effects.

RESULTS

Basic Models

We begin by reporting findings relevant to our first research question, which asked whether individuals experiencing an involuntary job loss would have poorer subsequent health. In Table 2 we present results from Model 1, which show the unadjusted effect of a past involuntary job loss on self-rated health and psychological distress. These coefficients represent the estimated difference in health associated with a past involuntary job loss, and standard errors associated with the coefficients are presented in parentheses. The results in Table 2 show that overall, self-rated health and psychological distress are significantly worse for ACL and WLS respondents who report a past involuntary job loss.

Having established a significant relationship between an involuntary job loss and subsequent health, we turn to the factors that may increase individuals' risk of job loss. In Table 3 we present results for Model 2, the estimated odds of an involuntary job loss, adjusting for the respondent's baseline educational attainment, annual earnings, marital status, employment sector, industry, and occupational standing. In Model 3, the likelihood of an involuntary job loss is significantly greater for men in the ACL but not in the WLS, while years of education are associated with a greater risk of job loss among WLS respondents but not ACL respondents. Being married significantly reduces the odds of job loss among ACL and WLS respondents. Working in the private sector increases the risk for both ACL and WLS respondents, with significantly greater influence for WLS men than women, while higher occupational standing is associated with significantly lowered risk among WLS respondents but not ACL respondents. In the ACL sample, the risk of involuntary job loss increases over time for women, while it declines over time for men, net of respondent's age.

Also presented in Table 3, the results for Model 3 show the impact of social selection on basic sociodemographic characteristics on our initial estimates of the relationship between involuntary job loss and subsequent health. Differences in self-rated health and psychological distress between individuals with an involuntary job loss and those without one are still statistically significant, though reduced, with the addition of these common controls for social position. Many of the commonly-included indicators of social position, including education and annual earnings, exert independent effects on health outcomes, as well as explaining a small part of the relationship between involuntary job loss and later health.

Controls for Selection

The results presented in Table 4 show how the unique measures associated with each data source are used to address our second research question, which asks whether the risk of involuntary job loss is greater for individuals in worse health, those of lower social position and those with less desirable working conditions. The results for Model 4 for the ACL sample show that the likelihood of experiencing an involuntary job loss is not significantly higher among women with poorer self-rated health, but that men with relatively poor self-rated health are actually significantly less likely to lose a job than their healthier counterparts (note the interaction term for male * self-rated health).[14]

The results of Model 4 for the WLS show that the likelihood of experiencing an involuntary job loss is lower for those individuals who had longer tenure with their employer in 1975, had access to a pension, and for men only, among those who were union members in their first jobs. These results suggest that individuals with better working conditions early in their careers are less likely to be selected into involuntary job loss. Moreover, parents' income in 1957 was positively associated with job loss for men and women, even after controlling for the host of covariates that indicate educational attainment and early working experiences. Overall, however, the addition of more extensive background characteristics in Model 4 for WLS respondents changes only slightly the effects observed in Model 3; for women, economic resources are now significantly positively associated with the risk of an involuntary job loss, while for men the

[14] To further explore possible aspects of health selection, we estimated two simpler models of involuntary job loss among ACL respondents that controlled for either self-rated health or psychological distress at baseline and other predictors in Model 3, but omitted measures of socioeconomic position (education, annual earnings), marital status, and working conditions (private sector, goods-producing industry, occupational standing) (results not shown here). We estimated these simpler models because of the well known association between health and socioeconomic position, marital status, and working conditions due to early life health and social selection that direct individuals into varying career pathways. Our baseline measures of health might not show an association with the risk of a subsequent involuntary job loss if the effect of prior health is already reflected in baseline socioeconomic achievement and success in the marriage market. We do find that in these simpler models, self-rated health is significantly positively associated with involuntary job loss among women, while it is significantly negatively associated with job loss among men. Psychological distress is significantly positively associated with the risk of an involuntary job loss for ACL respondents, with no difference by sex.

relationship is significantly negative. Taking the results for Model 4 together with the fact that there are few substantively important changes in the effects of predictors between Models 2 and 4 for ACL or WLS respondents, we conclude that while baseline measures of health or measures of family background and early career characteristics may add slightly to our ability to explain involuntary job loss, they may not greatly alter the results obtained from studies of job loss that do not include such measures. The interactive relationships between health and social position begin early in life, before the working career does, and shape the achieved socioeconomic characteristics that are often measured in studies of employment status and health.

Our third hypothesis proposed that the negative health impact of an involuntary job loss would persist when various controls for health selection and social selection are applied. Table 4 presents the results of our first test for persisting effects in Model 5. For ACL respondents, controlling for baseline measures of health means that we are now investigating the change in health between survey waves. We find that the change in self-rated health and psychological distress among respondents who experienced an involuntary job loss is significantly greater than the changes reported by those who did not lose a job.[15] For WLS respondents, adjusting for differences among respondents in family background, cognitive ability, and early work characteristics slightly reduces differences in health associated with a subsequent involuntary job

[15] The effect of adding an indicator for baseline health differed slightly for ACL men and women. ACL men with poor self-rated health at baseline are less likely to involuntary lose a job over follow-up, while women in poorer health are more likely to experience a job loss, as discussed above. This means that when we control for these opposite patterns of health-based selection at baseline, the estimated effect of an involuntary job loss on health increases somewhat for men, while it declines somewhat for women. There is no such difference in the models of psychological distress because there is no sex difference in the way that psychological distress influences the likelihood of involuntary job loss. We estimated a series of models to test whether in general, selection into and out of the labor force on the basis of physical health works similarly in the ACL as in other studies that test for health selection [ADD Arrow 1996, other relevant citations].We estimated models of the odds of entry and exit from the paid labor force using the same set of covariates as in the main analysis and found that as expected, as baseline self-rated health declines, the odds of subsequently leaving the labor force increase and the odds of entering paid work decline, with no differences by sex (results not shown). These findings reassure us that our conclusions about the relationship between self-rated health and involuntary job loss are not due to unique characteristics of the ACL sample, as well as suggesting further attention to the differences in selection mechanisms underlying involuntary job loss versus labor force exit.

loss. However, both self-rated health and psychological distress are still statistically significantly worse for respondents with an involuntary job loss.

Reasons for Involuntary Job Loss

More detailed examination reveals that the health of WLS respondents is affected differently by involuntary job losses sustained for different reasons. The results of Model 6, presented in Table 5, show that losses occurring as a result of being displaced or experiencing a temporary or seasonal loss are associated with a significant worsening of self-rated health, but the estimate associated with a job loss for health reasons is, as would be expected, much greater. Involuntary job losses due to displacement, firing/layoff, for health reasons and due to a temporary or seasonal job loss are all associated with statistically significantly greater psychological distress, compared with individuals who have not experienced a job loss. When we remove those WLS respondents who report a health-related job loss from the analytic sample for Model 7, the self-rated health of those with an involuntary job loss for other reasons no longer differs significantly from that of respondents without a prior loss. However, even after omitting losses for health reasons, the net effect of other types of loss on psychological distress is still statistically significant.

Temporal Ordering of Involuntary Job Loss and Health Shocks

Finally, the results in Table 6 demonstrate the potential importance of acute changes in health that may coincide with an involuntary job loss event. Such health shocks, typically not measured because they occur between the measure of baseline health and health at follow up, may have a large impact on our estimates of the way involuntary job loss impacts subsequent health. The results for Model 8 show that compared to respondents who did not experience an involuntary job loss or a serious or life-threatening health event in the past several years, self-rated health

became significantly worse for ACL respondents who experienced a health event but no job loss, a health event followed by a job loss, a job loss followed by a health event, and for those who experienced both events but the timing was indeterminate. Respondents showed significantly greater increases in psychological distress if they experienced a job loss but no health shock, a health shock but no job loss, or a health shock followed by an involuntary job loss, compared with their counterparts who experienced neither event. When we estimate Model 9, omitting ACL respondents who experienced a health event that clearly preceded or coincided with a job loss, we find that the effect of an involuntary job loss unaccompanied by or preceding a health event is still associated with a significant worsening of self-rated health and psychological distress, compared to respondents who did not report a loss. The results from Model 10, however, show that when we omit all respondents who reported a severe or life-threatening health event sometime within the person spell (whether accompanied by an involuntary job loss or not), the change in self-rated over the person-spell is no longer significantly greater for respondents who experienced an involuntary job loss than for those who did not. By contrast, there is still a significantly greater increase in psychological distress for those who lost a job involuntarily compared to those who did not, even when all respondents who suffered a health event are omitted from consideration.

DISCUSSION

The results of first stage of our analysis coincide with those from prior studies; we find that an involuntary job loss is associated with poorer subsequent self-rated overall health and greater psychological distress, and also find that people who report poorer health and those in less desirable jobs may be more likely to experience a future involuntary job loss. Where this analysis makes its contribution is with a series of models that adjust these initial findings in various ways

for the interacting effects of health and social selection. First, we find that deficits in the health of people who experience an involuntary job loss persist even when we take baseline health or family background and early work characteristics into account. However, using additional information on causes of job loss and the timing of life events not often available in survey data, we find that an involuntary job loss is associated with poorer self-rated health only when the loss is attributed specifically to health reasons (WLS) or occurs in close proximity to a serious or life-threatening health event (ACL). By contrast, psychological distress is greater for individuals with an involuntary job loss even when the loss does not occur for health reasons and does not take place around the time of an acute health event. Our confidence in these findings is bolstered by the considerable agreement in the results for the two surveys, despite large differences in the populations covered.

This analysis has some important implications for research on the relationship between social position and health. First, we find that while baseline measures of health or measures of family background and early career characteristics added slightly to our ability to explain who was at greatest risk of involuntary job loss, they did not greatly alter the results obtained from simpler models that only controlled for more contemporaneous and widely used measures of social position. Further analysis revealed that contemporary health and social position for the adults in our sample were interrelated, likely reflecting the interaction of social causation and selection processes earlier in life. Second, we also found that controlling for health at some earlier time point (such as the last survey wave) may not be sufficient to adjust for all instances of health selection; acute negative health events may be temporally proximate to the job loss event, and it is important to take these into consideration as alternate explanatory factors for health decline.

Table 1. Mean Value or Percentage for Outcome and Predictor Variables, ACL and WLS.

	ACL		WLS	
	No Job Loss	Had Job Loss	No Job Loss	Had Job Loss
Self-rated Health	2.32	2.51	1.80	1.97
	(0.948)	(1.05)	(0.631)	(0.760)
Psychological Distress[a]	-0.367	-0.163	2.45	2.64
	(0.817)	(0.993)	(0.915)	(0.944)
% Male	51.0	53.7	49.5	46.9
Education (years)	13.0	13.0	13.6	13.0
	(2.80)	(2.48)	(2.28)	(1.82)
% Married	73.7	67.4	89.0	87.9
Annual Earnings	37,914	40,076	37,297	32,219
	(31,858)	(34,672)	(41,142)	(37,530)
% Private Sector Employee	61.7	78.6	64.6	79.5
% Goods Producing Industry	27.3	34.4	26.8	33.6
Occupational Standing	-0.834	-0.984	0.660	0.314
	(1.56)	(1.37)	(1.36)	(1.20)
Age at Baseline	41.9	36.7	--	--
	(12.3)	(8.71)		
% Black	10.6	11.9	--	--
Baseline Self-rated Health	2.04	2.06	--	--
	(0.906)	(0.916)		
Baseline Psychological Distress	-0.101	0.181	--	--
	(0.954)	(1.07)		
Mother's Schooling	--	--	10.5	10.3
			(2.84)	(2.78)
Head's Occupational Status	--	--	33.0	32.5
			(21.6)	(20.6)
Parent's Income	--	--	6.33	6.33
			(0.082)	(0.087)
Mental Ability	--	--	101.9	100.4
			(14.7)	(14.7)
Labor Force Experience	--	--	64.4	64.4
			(28.3)	(28.9)

(Table continued below).

Table 1, continued. Mean Value or Percentage for Outcome and Predictor Variables, ACL and WLS.

	ACL		WLS	
	No Job Loss	Had Job Loss	No Job Loss	Had Job Loss
Employer Tenure	--	--	5.90	4.72
			(5.78)	(5.30)
% With Pension	--	--	60.5	47.1
% Union Member	--	--	23.0	19.4
N			7878	1822

Notes: Health outcomes measured in 2001 for ACL respondents and in 1992/3 for WLS respondents. Standard errors associated with variable means presented in parentheses. Figures based on weighted data, except for column totals.

Table 2. Estimated Coefficients for Effects of Involuntary Job Loss on Health Outcomes, Model 1.

	Self-Rated Health		Psychological Distress	
	ACL	WLS	ACL	WLS
Involuntary job loss	0.181*	0.170***	0.253***	0.186***
	(0.070)	(0.020)	(0.066)	(0.029)
N (Observations)	3853	na	3827	na
N (Individuals)	1778	6115	1776	5723
Wald Chi^2 / Adj. R^2	79.4***	0.012	92.1***	0.010

Notes: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, † $p < 0.10$. Standard errors of estimates in parentheses. Linear regression models are estimated for both outcomes. Model 1 for the ACL adjusts for respondent's age at baseline, race, the person-spell under observation (1986-1989, 1989-1994, or 1994-2001), and whether the respondent ever died over follow-up (estimates not shown).

Table 3. Estimated Coefficients for Basic Models of Job Loss and Health, Models 2 and 3.

	ACL[1]			WLS		
	Model 2	Model 3		Model 2	Model 3	
	Job loss	Self-rated Health	Psychological Distress	Job loss	Self-rated Health	Psychological Distress
Involuntary job loss	na	0.148*	0.226***	na	0.135***	0.162***
		(0.069)	(0.065)		(0.020)	(0.029)
Male	0.878**	-0.014	-0.004	0.284	0.383**	-0.602***
	(0.274)	(0.052)	(0.051)	(0.420)	(0.127)	(0.160)
Education (years)	-0.026	-0.035**	-0.038***	-0.054**	-0.035***	-0.034**
	(0.036)	(0.024)	(0.011)	(0.018)	(0.005)	(0.010)
Married	-0.482**	0.023	-0.065	-0.159†	-0.086**	-0.171***
	(0.148)	(0.045)	(0.042)	(0.091)	(0.027)	(0.040)
Annual Earnings	-0.106	-0.024	-0.064**	-0.011	0.00	0.007
	(0.081)	(0.024)	(0.024)	(0.023)	(0.007)	(0.008)
Private Sector Employee	0.756***	0.105*	-0.013	0.484***	-0.01	0.00
	(0.185)	(0.047)	(0.043)	(0.090)	(0.019)	(0.028)
Goods-producing Industry	0.077	0.036	0.021	0.055	0.047*	0.04
	(0.187)	(0.058)	(0.054)	(0.070)	(0.021)	(0.031)
Occupational Standing	0.037	-0.031†	-0.069**	-0.111***	-0.036***	-0.027*
	(0.052)	(0.018)	(0.021)	(0.028)	(0.008)	(0.012)
Age at Baseline	-0.031***	0.005*	-0.008***	--	--	--
	(0.008)	(0.002)	(0.002)			
Years Between Waves	0.095***	0.004	-0.005†	--	--	--
	(0.018)	(0.003)	(0.003)			
Ever Died Over Follow-up	0.139	0.447***	0.222*	--	--	--
	(0.331)	(0.113)	(0.093)			
Black	0.180	0.335***	0.297***	--	--	--
	(0.159)	(0.078)	(0.055)			
Male * Years Between Waves	-0.065**	--	0.943*	--	--	--
	(0.024)		(0.023)			
Male * Black	--	-0.257*	--	--	--	--
		(0.110)				
Male * Occupational Standing		--	0.072**	--	--	--
			(0.027)			

(Table continued below.)

Table 3, continued. Estimated Coefficients for Basic Models of Job Loss and Health, Models 2 and 3.

	ACL[1]			WLS		
	Model 2	Model 3		Model 2	Model 3	
	Job loss	Self-rated Health	Psychological Distress	Job loss	Self-rated Health	Psychological Distress
Male * Annual Earnings	--	--	--	-0.057	-0.030*	--
				(0.041)	(0.013)	
Male * Private Sector Employee	--	--	--	0.353*	--	--
				(0.138)		
Male * Education (years)	--	--	--	--	--	0.039**
						(0.012)
Constant	-2.13*	1.36***	0.859**	-0.549	2.34***	3.18***
	(0.889)	(0.217)	(0.282)	(0.335)	(0.095)	(0.161)
N (Observations)	3843	3843	3818	na	na	na
N (Individuals)	1778	1778	1776	7330	6115	5723
Wald Chi^2/LR $Chi^{2/}$Adj. R^2	81.6***	124.8***	169.1***	219.8***	0.044	0.017

Notes: *** p < 0.001, ** p < 0.01, * p < 0.05, † p < 0.10. Standard errors of estimates in parentheses.

Table 4. Estimated Coefficients for Extended Models of Job Loss and Health, Models 4 and 5.

	ACL[1]			WLS		
	Model 4	Model 5		Model 4	Model 5	
	Job loss	Self-rated Health	Psychological Distress	Job loss	Self-rated Health	Psychological Distress
Involuntary job loss	na	0.145*	0.183**	na	0.129***	0.155**
		(0.057)	(0.057)		(0.020)	(0.030)
Male	1.57***	-0.013	0.016	1.07*	0.434**	-0.735***
	(0.446)	(0.034)	(0.035)	(0.447)	(0.134)	(0.177)
Education (years)	-0.029	-0.018*	-0.025**	-0.086***	-0.031***	0.001
	(0.035)	(0.009)	(0.008)	(0.020)	(0.005)	(0.008)
Married	-0.452**	-0.010	0.032	-0.187*	-0.084**	-0.158***
	(0.151)	(0.032)	(0.031)	(0.093)	(0.028)	(0.040)
Annual Earnings	-0.104	0.000	-0.045*	0.082**	0.001	-0.002
	(0.082)	(0.018)	(0.019)	(0.026)	(0.008)	(0.009)
Private Sector Employee	0.767***	0.081*	-0.017	0.442***	0.006	0.018
	(0.185)	(0.032)	(0.032)	(0.093)	(0.020)	(0.029)
Goods-producing Industry	0.067	0.014	-0.005	0.204**	0.051*	0.041
	(0.186)	(0.039)	(0.038)	(0.072)	(0.022)	(0.031)
Occupational Standing	0.049	-0.019	-0.035*	-0.103**	-0.028**	-0.007
	(0.053)	(0.012)	(0.016)	(0.030)	(0.008)	(0.012)
Age at Baseline	-0.030***	0.003*	-0.004**	--	--	--
	(0.008)	(0.001)	(0.001)			
Years Between Waves	0.095***	-0.005†	0.002	--	--	--
	(0.018)	(0.003)	(0.003)			
Ever Died Over Follow-up	0.179	0.263**	0.224**	--	--	--
	(0.328)	(0.085)	(0.075)			
Black	0.135	0.180***	0.188***	--	--	--
	(0.161)	(0.048)	(0.037)			
Baseline Self-rated Health	0.168	0.517***	--	--	--	--
	(0.110)	(0.020)				
Baseline Psychological Distress	0.093	--	0.436***	--	--	--
	(0.081)		(0.025)			

(Table continued below.)

Table 4, continued. Estimated Coefficients for Extended Models of Job Loss and Health, Models 4 and 5.

	ACL[1]			WLS		
	Model 4	Model 5		Model 4	Model 5	
	Job loss	Self-rated Health	Psychological Distress	Job loss	Self-rated Health	Psychological Distress
Mother's Schooling (1957)	--	--	--	-0.01 (0.011)	-0.010** (0.003)	-0.018*** (0.005)
Head's Occupational Status (1957)	--	--	--	0.00 (0.002)	-0.001 (0.000)	0.001 (0.001)
Parent's Income (1957)	--	--	--	0.693† (0.390)	-0.037 (0.111)	0.021 (0.163)
Mental Ability (11th grade)	--	--	--	0.00 (0.002)	0.000 (0.001)	-0.008*** (0.001)
Labor Force Experience (1975)	--	--	--	0.00 (0.001)	0.000 (0.000)	0.000 (0.001)
Employer Tenure (1975)	--	--	--	-0.050*** (0.006)	-0.002 (0.002)	-0.004 (0.003)
Had Pension (1975)	--	--	--	-0.656*** (0.092)	-0.009 (0.026)	-0.056† (0.029)
Union Member (First Job)	--	--	--	0.297* (0.129)	0.072** (0.022)	0.079* (0.033)
Male * Years Between Waves	-0.059* (0.025)	--	--	--	--	--
Male * Baseline Self-rated Health	-0.335* (0.163)	--	--	--	--	--
Male * Black	--	-0.132† (0.071)	--	--	--	--
Male * Occupational Standing	--	--	0.042* (0.019)	--	--	--
Male * Private Sector Employee	--	--	--	0.432** (0.142)	--	--
Male * Annual Earnings	--	--	--	-0.126** (0.044)	-0.029* (0.013)	--
Male * Had Pension (1975)	--	--	--	0.236† (0.132)	-0.088* (0.038)	--

(Table continued below.)

Table 4, continued. Estimated Coefficients for Extended Models of Job Loss and Health, Models 4 and 5.

	ACL[1]			WLS		
	Model 4	Model 5		Model 4	Model 5	
	Job loss	Self-rated Health	Psychological Distress	Job loss	Self-rated Health	Psychological Distress
Male * Union Member (First Job)	--	--	--	-0.624*** (0.161)	--	--
Male * Mental Ability	--	--	--	--	--	0.006*** (0.002)
Constant	-2.50** (0.959)	1.36*** (0.217)	0.493* (0.210)	-4.94* (2.45)	2.61*** (0.701)	3.52** (1.03)
N (Observations)	3839	3843	3816	na	na	na
N (Individuals)	1778	1778	1776	7330	6115	5723
Wald Chi^2/LR Chi^2/Adj. R^2	83.9***	966.8***	713.5***	407.6***	0.049	0.027

Notes: *** p < 0.001, ** p < 0.01, * p < 0.05, † p < 0.10. Standard errors of estimates in parentheses.

Table 5. Estimated coefficients associated with specific reasons for job loss, WLS men and women, Models 6 and 7.

	Model 6		Model 7	
	Self-Rated Health	Psychological Distress	Self-Rated Health	Psychological Distress
Displacement	0.056*	0.110**	--	--
	(0.025)	(0.037)		
Firing/Layoff	-0.018	0.159*	--	--
	(0.045)	(0.065)		
Loss for Health Reasons	0.499***	0.269***	--	--
	(0.043)	(0.061)		
Temporary/Seasonal Loss	0.139†	0.341**	--	--
	(0.079)	(0.113)		
Business Failure	0.111	-0.030	--	--
	(0.123)	(0.174)		
Involuntary Job Loss, not for Health Reasons	--	--	0.021	0.109**
			(0.021)	(0.032)

Notes: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, † $p < 0.10$. Standard errors of estimates in parentheses.

Table 6. Estimated coefficients associated ordering of job loss and health shocks, ACL men and women, Models 8, 9 and 10.

	Model 8		Model 9		Model 10	
	Self-Rated Health	Psychological Distress	Self-Rated Health	Psychological Distress	Self-Rated Health	Psychological Distress
Had Job Loss, No Health Shock	0.097	0.153*	--	--	--	--
	(0.063)	(0.067)				
No Job Loss, Had Health Shock	0.403***	0.206***	--	--	--	--
	(0.042)	(0.038)				
Health Shock, Then Job Loss	0.426**	0.612***	--	--	--	--
	(0.161)	(0.154)				
Job Loss, Then Health Shock	0.587***	0.174	--	--	--	--
	(0.144)	(0.120)				
Indeterminate Timing of Job Loss and Health Shock	0.685**	0.237	--	--	--	--
	(0.221)	(0.212)				
Involuntary Job Loss, not for Health Reasons	--	--	0.133*	0.117*	0.095	0.165*
			(0.059)	(0.059)	(0.063)	(0.067)

Notes: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, † $p < 0.10$. Standard errors of estimates in parentheses.

SOURCES

Arrow, J.O. 1996. "Estimating the Influence of Health as a Risk Factor on Unemployment: A Survival Analysis of Employment Durations for Workers Surveyed in the German Socio-Economic Panel." *Social Science and Medicine* 42:1651-1659.

Bartley, M.J. 1994. "Unemployment and Ill Health: Understanding the Relationship." *Journal of Epidemiology and Community Health* 48:333-337.

Bartley, M.J., J.E. Ferrie, and S.M. Montgomery. 1999. "Living in a High-Unemployment Economy: Understanding the Health Consequences." Pp. 81-104 in *Social Determinants of Health*, edited by M.G. Marmot and R.G. Wilkinson. Oxford: Oxford University Press.

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.

Belgrave, L.L., M.R. Haug, and F. Gomez-Bellenge. 1987. "Gender and Race Differences in the Effects of Health and Pension on Retirement Before 65." *Comparative Gerontology B* 1:108-117.

Broman, C.L., V.K. Hamilton, W.S. Hoffman, and R. Mavaddat. 1995. "Race, Gender, and the Response to Stress: Autoworkers' Vulnerability to Long-Term Unemployment." *American Journal of Community Psychology* 23:813-842.

Catalano, Ralph, David Dooley, G. Wilson, and R. Hough. 1993. "Job Loss and Alcohol Abuse: A Test Using Data from the Epidemiologic Catchment Area Project." *Journal of Health and Social Behavior* 34:215-225.

Chirikos, T.N., and G. Nestel. 1984. "Economic Determinants and Consequences of Self-Reported Work Disability." *Journal of Health Economics* 3:117-136.

DiPrete, Thomas A., and Patricia A. McManus. 2000. "Family Change, Employment Transitions, and the Welfare State: Household Income Dynamics in the United States and Germany." *American Sociological Review* 65:343-370.

Dooley, David, Ralph Catalano, and R. Hough. 1992. "Unemployment and Alcohol Disorder in 1910 and 1990: Drift Versus Social Causation." *Journal of Occupational and Organizational Psychology* 65:277-290.

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.

Dooley, David, Jonathan Fielding, and Lennart Levi. 1996. "Health and Unemployment." *Annual Review of Public Health* 17:449-465.

Ferrie, J.E. 1997. "Labour Market Status, Insecurity and Health." *Journal of Health Psychology* 2.

Gallo, William T., Elizabeth H. Bradley, Michele Siegel, and Stanislav V. Kasl. 2001. "The Impact of Involuntary Job Loss on Subsequent Alcohol Consumption by Older Workers: Findings From the Health and Retirement Survey." *Journal of Gerontology: Social Sciences* 56B:S3-S9.

Hannan, Michael T., and A.A. Young. 1977. "Estimation in Panel Models: Results on Pooling Cross-Sections and Time Series." Pp. 52-83 in *Sociological Methodology 1977*, edited by D.R. Heise. San Francisco, CA: Jossey-Bass.

Hauser, Robert M., and John Robert Warren. 1997. "Socioeconomic Indexes of Occupational Status: A Review, Update, and Critique." Pp. 177-298 in *Sociological Methodology 1997*, edited by A. Raftery. Cambridge: Blackwell Publishers.

Hayes, John, and Peter Nutman. 1981. *Understanding the Unemployed: The Psychological Effects of Unemployment*. London: Tavistock.

Herd, Pamela, James S. House, Jeffrey Morenoff, and Brian Goesling. 2004. "Longer-Term Consequential Effects of Income on Health and Health on Income: An Empirical Evaluation." Ann Arbor: University of Michigan.

House, James S. 1987. "Chronic Stress and Chronic Disease in Life and Work: Conceptual and Methodological Issues." *Work and Stress* 1:129-134.

House, James S., Ronald C. Kessler, A. Regula Herzog, Richard P. Mero, Anne M. Kinney, and Martha J. Breslow. 1990. "Age, Socioeconomic Status and Health." *The Milbank Quarterly* 68:383-411.

House, James S., James M. Lepkowski, Anne M. Kinney, Richard P. Mero, Ronald C. Kessler, and A. Regula Herzog. 1994. "The Social Stratification of Aging and Health." *Journal of Health and Social Behavior* 35:213-234.

Iversen, L., and H. Klausen. 1986. "Alcohol Consumption Among Laid-Off Workers Before and After Closure of a Danish Ship-yard: A 2-Year Follow-up study." *Social Science and Medicine* 22:107-109.

Jacobson, L.S., R.L. LaLonde, and D.G. Sullivan. 1993. "Earnings Losses of Displaced Workers." *American Economic Review* 83:685-709.

Jahoda, M. 1982. *Employment and Unemployment. A Social-Psychological Analysis*. Cambridge: Cambridge University Press.

Kasl, S.V., S. Gore, and S. Cobb. 1975. "The Experience of Losing a Job: Reported Changes in Health, Symptoms and Illness Behavior." *Psychosomatic Medicine* 37:106-122.

Kasl, S.V., and Beth A. Jones. 2000. "The Impact of Job Loss and Retirement on Health." Pp. 118-137 in *Social Epidemiology*, edited by Lisa F. Berkman and Ichiro Kawachi. New York: Oxford University Press.

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.

Kendler, Kenneth S., Laura M. Thornton, and Carol A. Prescott. 2001. "Gender Differences in the Rates of Exposure to Stressful Life Events and Sensitivity to Their Depressogenic Effects." *American Journal of Psychiatry* 158:587-593.

Kessler, Ronald C., James S. House, and J. Blake Turner. 1987. "Unemployment and Health in a Community Sample." *Journal of Health and Social Behavior* 28:51-59.

Klein-Hesselink, D.J., and I.P. Spruit. 1992. "The Contribution of Unemployment to Socioeconomic Health Differences." *International Journal of Epidemiology* 21:329-337.

Kohout, F., L. Berkman, D. Evans, and J. Coroni-Huntley. 1993. "Two Shorter Forms of the CES-D (Center for Epidemiological Studies Depression) Depression Symptoms Index." *Journal of Aging and Health* 5:179-193.

Korpi, Tomas. 2001. "Accumulating Disadvantage: Longitudinal Analyses of Unemployment and Physical Health in Representative Samples of the Swedish Population." *European Sociological Review* 17:255-273.

Laheima, E. 1989. "Unemployment, Reemployment and Mental Well-Being. A Panel Survey of Industrial Job Seekers in Finland." *Scandinavian Journal of Social Medicine* 43 (Suppl.).

Lee, A.J., I.K. Crombie, W.C.S. Smith, and H.D. Tunstall-Pedoe. 1991. "Cigarette Smoking and Employment Status." *Social Science and Medicine* 33:1309-1312.

Leino-Arjas, Paivi, J. Liira, P. Mutanen, A. Malmivaara, and E. Martikainen. 1999. "Predictors and Consequences of Unemployment Among Construction Workers: Prospective Cohort Study." *British Medical Journal* 319:600-605.

Link, Bruce G., and Jo C. Phelan. 1995. "Social Conditions as Fundamental Causes of Disease." *Journal of Health and Social Behavior* 35:80-94.

Linn, M.W., R. Sandifer, and S. Stein. 1985. "Effects of Unemployment on Mental and Physical Health." *American Journal of Public Health* 75:502-506.

Loprest, P., K. Rupp, and S. Sandell. 1995. "Gender, Disabilities, and Employment in the Health and Retirement Study." *Journal of Human Resources* 30:S293-S318.

Marmot, M.G., M. Kogevina, and M.A. Elston. 1987. "Social/economic Status and Disease." *Annual Review of Public Health* 8:111-135.

Mastekaasa, A. 1996. "Unemployment and Health: Selection Effects." *Journal of Community and Applied Social Psychology* 6:189-205.

McDonough, Peggy, and Benjamin C. Amick III. 2001. "The Social Context of Health Selection: A Longitudinal Study of Health and Employment." *Social Science and Medicine* 53:135-145.

Montgomery, S.M., D.G. Cook, M.J. Bartley, and M.E.J. Wadsworth. 1998. "Unemployment, Cigarette Smoking, Alcohol Consumption and Body Weight in Young British Men." *European Journal of Public Health* 8:21-27.

Mullahy, J., and J. Sindelar. 1990. "Gender Differences in the Effects of Mental Health on Labor Force Participation." *Research in Human Capital and Development* 6:125-146.
Muntaner, Carles, William W. Eaton, Richard Miech, and Patricia O'Campo. 2004. "Socioeconomic Position and Major Mental Disorders." *Epidemiologic Reviews* 26:53-62.
Nylen, L., M Voss, and B. Floderus. 2001. "Mortality Among Women and Men Relative to Unemployment, Part Time Work, and Extra Work: A Study Based on Data from the Swedish Twin Registry." *Occupational and Environmental Medicine* 58:52-57.
Pearlin, Leonard I., Morton A. Lieberman, Elizabeth A. Menaghan, and Joseph T. Mullen. 1981. "The Stress Process." *Journal of Health and Social Behavior* 22.
Platt, S. 1984. "Unemployment and Suicidal Behavior." *Social Science and Medicine* 19:93-115.
Radloff, Lenore S. 1977. "The CES-D Scale: A Self-Report Depression Scale for Research in the General Population." *Applied Psychological Measurement* 1:385-401.
Repetti, Rena L., Karen A. Matthews, and Ingrid Waldron. 1989. "Employment and Women's Health. Effects of Paid Employment on Women's Mental and Physical Health." *American Psychologist* 44:1394-1401.
Ruhm, C.J. 1992. "The Effects of Physical and Mental Health on Female Labor Supply." Pp. 152-181 in *Economics and Mental Health*, edited by R.G. Frank and W.G. Manning. Baltimore, MD: Johns Hopkins Press.
Sewell, William H., Robert M. Hauser, Kristen Springer, and Taissa S. Hauser. 2001. "As We Age: A Review of the Wisconsin Longitudinal Study, 1957-2001." in *Center for Demography and Ecology Working Papers*. Madison.
Stolzenberg, Ross M. 2001. "It's About Time and Gender: Spousal Employment and Health." *American Journal of Sociology* 107:61-100.
Theorell, Tores G.T. 1982. "Review of Research on Life Events and Cardiovascular Illness." *Advance Cardiology* 29:140-147.
Turner, J. Blake. 1995. "Economic Context and the Health Effects of Unemployment." *Journal of Health and Social Behavior* 36:213-229.
Vagero, D., and R. Illsley. 1995. "Explaining Health Inequalities: Beyond Black and Barker." *European Sociological Review* 11:219-241.
Vagero, D., and Eero Lahelma. 1996. "Women, Work, and Mortality. An Analysis of the Relation Between Female Labour Participation and Female Mortality Rates." in *Women, Stress, and Heart Disease*, edited by K. Orth-Gomer, M.A. Chesney, and N.K. Wenger. Hillsdale, NJ: Erlbaum.
Valkonen, T., and P. Martikainen. 1995. "The Association Between Unemployment and Mortality: Causation or Selection?" Pp. 201-222 in *Adult Mortality in Developed Countries: From Description to Explanation*, edited by A.D. Lopez, G. Caselli, and T. Valkonen. Oxford: Clarendon Press.
van de Mheen, H., K. Stronks, C.T.M. Schrijvers, and J.P. Machenback. 1999. "The Influence of Adult Ill Health on Occupational Class Mobility and Mobility Out of and Into Employment in the Netherlands." *Social Science and Medicine* 49:509-518.
Waldron, Ingrid. 1980. "Employment and Women's Health: An Analysis of Causal Relationships." *International Journal of Health Services* 10:435-454.
Williams, David R., and Chiquita Collins. 1995. "US Socioeconomic and Racial Differences in Health: Patterns and Explanations." *Annual Review of Sociology* 21:349-386.
Zeger, Scott L., and Kung-Yee Liang. 1986. "Longitudinal Data Analysis for Discrete and Continuous Outcomes." *Biometrics* 42:121-130.
—. 1992. "An Overview of Methods for the Analysis of Longitudinal Data." *Statistics in Medicine* 11:1825-1839.