

**The Incidence of Job Loss:
The Shift from Younger to Older Workers,
1981-1996**

Michele Siegel, Charlotte Muller, and Marjorie Honig

**International Longevity Center-USA
60 East 86th Street
New York, NY 10028-1009
(212) 288-1468 — www.ilcusa.org**

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About the Authors

Michele Siegel, former Research Associate at The International Longevity Center, is a post-doctoral fellow in the School of Epidemiology and Public Health, Yale University.

Charlotte Muller, Co-Director of Research at The International Longevity Center, is Professor Emerita of Economics, The Graduate School of the City University of New York.

Marjorie Honig, Co-Director of Research at The International Longevity Center, is Professor and Chair of the Department of Economics, Hunter College, The City University of New York.

THE INCIDENCE OF JOB LOSS: THE SHIFT FROM YOUNGER TO OLDER WORKERS, 1981-1996

1. INTRODUCTION

Involuntary job loss has attracted more public attention in the 1990's than in the severe economic downturn of the early 1980's. One explanation may be that new categories of workers appear to be bearing the brunt of recent displacements, raising questions about restructuring in the economy and, in the case of older workers, the viability of the implicit long-term employment contract (Farber 1993, 1997; Gardner 1995). Once displaced, older workers experience long-term reductions in employment probabilities and substantial earnings losses on re-employment, reducing the private retirement resources of older households at a time when public retirement support is declining (Jacobson, LaLonde, and Sullivan, 1993; Couch 1998, Chan and Stevens 1999).

We examine the relationship between job loss and age over the last two decades using the biennial Displaced Worker Supplement to the Current Population Survey. Our focus is on full-time workers and we limit our definition of job loss to the three categories that most clearly represent involuntary job loss in the Displaced Worker Supplements (DWS): plant closing, slack work, and position or shift abolished. We compare workers aged 25-39 with those aged 45-59 and examine differences in job loss rates in the cross-section and changes in these relative rates over time. We analyze job loss separately for men and women and, within gender, by education, occupation, and industry.

Our findings suggest that the relative position of older male workers declined more over the period than indicated in previous studies. In the 1981-82 recession, job loss rates of men aged 25-39 were 60 percent higher than those of workers aged 45-59, reflecting the long-standing practice of inverse-seniority layoffs. In the recession in the early 1990's, however, the rates of younger workers were no higher than those of older workers. This deterioration in the relative position of older men occurred during a very short time span: the period immediately before and during the early 1990's recession. From the 1981-82 recession, job loss rates of the two age groups declined in tandem to the end of the expansion in the late 1980's. Rates then increased sharply among older men, while moving up only moderately among younger men. This pattern suggests that the causes of the change in relative job loss may be specific to this short period of economic slowdown rather than to longer-term shifts in the economy such as changes in technology or market structure.

Our most striking finding is the significant deterioration in the relative position of older blue-collar workers. While the short and relatively mild downturn of the early 1990's is perceived as a white-collar recession and public interest has focused on job loss among older male managers and administrators, the largest changes between this recession and the earlier, more severe downturn occurred among male high school graduates and those with some college education working in blue-collar occupations. Older female blue-collar workers with some college education, moreover, were the only group among women to experience a significant change in relative job loss.

Public perception, however, was not entirely unfounded. Older male white-collar workers with high school diplomas and above also suffered a decline in their relative position.

One group, college graduates, experienced an absolute change: In the early 1990's recession, the job loss rate of older college graduates was significantly higher than that of younger graduates.

In the next section, we review some recent studies that have included discussions of differences in job loss by age. We then discuss how we define job loss in this study and how we deal with methodological issues related to the DWS data such as the change in the reporting period in more recent DWS's and the problem of identifying temporary layoffs. We next outline our methods for identifying relative job loss by age in both univariate and multivariate analyses. We discuss our findings in the following section and conclude with a brief summary.

2. RECENT FINDINGS ON JOB LOSS AMONG OLDER WORKERS

A number of studies, summarized in Fallick (1996), Farber (1997), Kletzer (1998), and Gottschalk and Moffitt (1999), have examined the broad patterns of job loss in the U.S. over the last two decades. We focus our discussion here on studies that have included findings on displacement among older workers. The evidence on whether there has been an increase in the relative displacement of older workers over time is mixed.

Several studies have traced job loss rates by age using the Displaced Worker Surveys beginning with the first survey in 1984 (Farber 1993, 1997; Gardner 1995; Hipple 1999). Farber (1993) finds displacement rates of older, but not younger, male workers higher in the recession of 1990-91 than in the slack labor market of 1982-83,¹ but rates of younger workers consistently

¹The years 1982-83 cover the latter part of the recession which by National Bureau of Economic Research designation started in July 1981 and ended in November 1982.

higher than those of older workers throughout the period.² He detects no appreciable change in the job loss rates of either younger or older female workers in the later recession compared to the earlier recession, findings similar to those reported below for full-time female workers. Overall, he finds displacement rates marginally higher in the later recession than in the earlier, more severe recession.

Gardner (1995) examines job loss rates of all workers (male and female; full- and part-time combined) with at least three years of tenure on the job. She finds that the pattern of displacement differs by age over the period but, unlike Farber, that the absolute level of job loss is no greater for older than for younger workers in 1991-92. Displacement rates of workers aged 25-34 decline from 5 percent in 1981-82 to 3.5 percent in 1985-86, then increase marginally to 3.8 percent in 1991-92. Rates of workers aged 45-54, in contrast, remain stable at or near 3 percent from 1981-82 to 1985-86, decline to 2.2 percent in 1987-88, then increase to 3.8 percent in 1991-92. Hipple (1999) updates these findings to 1995-96, reporting a uniform decline in job loss rates of both age groups to 2.9 percent and 3.0 percent, respectively. These findings on long-tenured workers coincide more closely than those of Farber (1993) with the findings in this study.

Farber (1997) examines job loss from 1981 to 1995, adding information from the 1994 and 1996 DWS's to earlier data. The definition of job loss in this later study is expanded from the three basic classifications of plant closing, slack work, and position abolished (used also by

² He also finds that rates of younger workers are higher in the 1990-91 recession than in the expansion of 1985-86, which differs from the pattern of job loss among full-time male workers found in this study. This difference may reflect the large increase in displacements among young part-time men in the 1990's recession. Our data indicate that job loss rates of part-time males aged 25-39 increased from 3.1 percent in 1985-86 to 8.9 percent in 1991-92, compared to rates of young full-time workers of 5.4 and 5.5 percent, respectively.

Gardiner and Hipple) to include a fourth category defined as “other,” which includes two additional DWS categories: seasonal job ended and other (unspecified). Farber finds that overall displacement rates in 1991-93 are similar to those in the earlier, more severe recession and that job loss increased over the period among older men. Job loss for “other” reasons comprises an increasing share of overall job loss in the latter part of the period Farber examines, however, and thus his findings are not comparable to those reported in this study.³

Studies using DWS data to examine trends in job instability (quits plus involuntary job loss) do not detect differential patterns by age. Diebold, Neumark, and Polsky (1997) conclude that the probability of retaining a job over the 1980's did not decline for either younger or older workers. Updating this study, Neumark, Polsky, and Hansen (1999) find that job stability declined from the mid-1980's to the mid-1990's but that, consistent with the earlier study, the rate of decline did not differ between workers aged 25-39 and 40-54.

Using data from the Panel Study of Income Dynamics (PSID), Polsky (1999) finds no significant increase in the probability of job separation for older male workers between 1976-81 and 1986-91, but does find some increase in the incidence of involuntary job loss relative to quits for male workers. In contrast, Gottschalk and Moffitt (1999), using data from the PSID and the Survey of Program Participation (SIPP), finds a significant decline in the hazard of a job separation from 1980-81 to 1991-92, the largest decline occurring in the hazard rate of older

³By 1993-95, “other” is the modal job-loss category. Job loss, moreover, continued to increase through 1993-95, a result Farber found puzzling. This finding also differs from the results presented below in Table 1 and reflects increases over the period in the “other” category of job loss (Appendix Table 1, Farber 1997).

male workers, and no indication of an increase in the proportion of involuntary job separations among older males.

3. MEASURING JOB LOSS

We use data from DWS's from 1984-1998 to compare the incidence of job loss among workers aged 25-39 and 45-59. We examine these two age groups to focus more sharply on differences in job loss over this period between two groups of prime-age workers who are legally differentiated under Federal law prohibiting age discrimination.⁴ This approach also allows us to avoid a potentially serious bias (discussed below), for which there is no satisfactory correction, arising from a change in the reporting period of displacements in the 1994 and subsequent DWS's. The DWS interviews individuals aged 20 and older who report an involuntary job loss. We exclude ages 20-24 from our younger category because displacements at these ages may reflect college enrollment rates, which changed over the period in our analysis.⁵ We also exclude ages 60 and above from our older group because of changes over this period in the average retirement age and possibly in the extent to which older workers take early retirement options when faced with expected job loss. We restrict our analysis to full-time workers because of our interest in the potential implications of differential job loss for the implicit long-term employment contract.⁶

⁴The Age Discrimination in Employment Act of 1967 protects individuals 40 years and older from discrimination in hiring, discharge, compensation, and other terms of employment.

⁵College attendance rates of women in particular increased over this period (Gottschalk and Pizer, 1999).

⁶The pattern of part-time job loss differs from that of full-time job loss by age (not reported in detail here, but see ft.2).

We define job loss as follows. The DWS asks respondents whether they lost or left a job because their plant or company closed or moved, their position or shift was abolished, there was insufficient work, a seasonal job ended, self-employment ended, or for some other reason. We limit our definition of job displacement to the first three substantively important categories. A Bureau of Labor Statistics analysis of debriefing data of the 1996 DWS sample indicates that at most 20 percent of the “other reason” responses might be interpreted as job displacement; the largest share appears to reflect voluntary job leaving (Esposito and Fisher, 1998).⁷ The remaining two categories are not of interest for our study. Displacement is defined in interviewer instructions as involuntary separation based on operating decisions of the employer. Quits and layoffs for reasons specific to the individual worker alone such as poor work performance or disciplinary problems are not considered displacement (U.S. Department of Commerce, 1988).⁸

DWS’s prior to 1994 asked respondents if they were displaced from a job at any time in the preceding five years; the 1994 and subsequent surveys ask about job loss in the preceding three-year period. This change in wording was adopted because of evidence indicating significant recall bias in the fourth and fifth years prior to the interview (Gardner 1995). This change poses a potentially serious problem for analysts because the surveys ask about the longest rather than the most recent job lost in the relevant time period. Thus, DWS’s from 1994 record

⁷“Other reason” responses constitute the largest share of the “other” category in Farber (1997). On the basis of early debriefing information, Farber estimated that 24 percent of the “other” category may be involuntary job loss and adjusted estimates of job loss in all DWS’s accordingly. This adjustment assumes, however, that the proportion of ‘true’ involuntary job loss in the “other” category remained constant over time even though the category grew substantially, an assumption that may not be warranted.

⁸ See Farber (1993, 1997) for discussions of remaining ambiguities between voluntary and involuntary job loss.

displacements in the first three years prior to the survey that may have been preceded by displacements from longer-tenure jobs in the fourth or fifth year. Similar displacements are not captured in the analyst's measure of displacement from DWS's prior to 1994, however, since the count must be restricted to displacements occurring in the first three years for comparability with later surveys.

Farber (1997) estimates the missing displacements using a correction factor based on the proportion of workers in the PSID displaced in the fourth or fifth year prior to the interview who were also displaced in the first three years.⁹ This correction, however, overestimates displacements in the surveys prior to 1994 because it double-counts workers whose displacements in the three years immediately prior to a survey were of longer duration than their displacements in the fourth or fifth years. These workers appear both in Farber's count of observed displacements (within three years prior to the survey) and in his estimated count of displacements within the first three years that were preceded by displacements in the fourth or fifth years.

Farber's correction is also flawed because displacements are defined more loosely in the PSID than in the DWS. In the PSID, a displacement is considered to have occurred if a worker left a job because a plant or business closed or because s/he was laid off or fired. Boisjoly, Duncan, and Smeeding (1994) examines the specific types of job separations included in the laid-

⁹For each DWS prior to 1994, he estimates the total number of workers displaced as the sum of three values: (1) the observed number displaced three or fewer years before the survey; (2) the number displaced four years before the survey multiplied by the PSID correction factor (the proportion of workers displaced four years before PSID interviews who also lost a job within three years of PSID interviews); and (3) the number displaced five years before the DWS survey multiplied by the appropriate PSID correction factor (the proportion of workers displaced five years before PSID survey years who also lost a job within three years of PSID interviews).

off or fired category and finds that approximately 16% of workers in that category report having been fired for cause, a category explicitly excluded from the DWS definition of displacement. Thus, while Farber's correction is the best afforded by the data, it introduces new biases as it reduces others.

Unlike Farber, we examine differences in displacement rates between younger and older workers over time. We thereby avoid any bias that may arise from exclusion of displacements in surveys prior to 1994 because both younger and older workers are subject to potential undercounting. The magnitude of undercounting may differ between the two age groups in the cross-section, moreover, without biasing the change in the difference in their displacement rates over time. Bias will occur, however, if the relative magnitudes of the undercounting change over time; that is, if the difference between younger and older workers in the ratio of fourth and fifth year displacements to first to third year displacement changes between the two cross-sections we compare. In this case, the change in the difference in displacement rates over time between the two groups would not be an accurate measure of the actual change in differential job loss. Examination of displacements in the 1984 and 1992 DWS's, which cover two recessionary periods prior to the change in the definition of displacement, indicates that the number of fourth and fifth year displacements per second and third year displacement is nearly identical for younger and older workers in each survey, and that the numbers change proportionally (by small amounts) between the two recessions.¹⁰

¹⁰We use only the second and third years prior to the interview for reasons discussed below. We are unable to compare expansionary periods because the 1990's expansion is recorded in the 1998 DWS, after the change in the time frame for reporting displacements. We choose to use the 1994 rather than the 1992 DWS to measure the 1990's recession in our analysis for reasons discussed below. The 1992 DWS, however, covers 1990, the year in which the recession began, and thus provides a reasonable comparison

We measure displacements occurring in the second and third years prior to the interview only, thereby restricting our analysis to two-year displacement periods. The large number of reported displacements in the first year prior to the survey compared to earlier years suggests that first-year displacements include a high proportion of temporary layoffs of workers awaiting recall (Gardner 1995).¹¹

To determine job loss rates, we follow Farber (1997) in using as the base of our denominator the most straightforward measure available of those at risk of losing jobs in the relevant period, the number in the age-gender-year group employed at the time of the survey.¹² While it would be preferable to divide the number of job losers in our recall period by the number of workers at risk of job loss during the period, there is no obvious measure of this latter number. Our measure is a reasonable approximation if employment is not changing rapidly over the three-year displacement periods we use.

We add to the number of workers employed at the time of the survey those workers displaced (and thus at risk) during the recall period but not employed at the time of the survey. We eliminate another potential source of bias in our estimates of relative job loss (displacement rates of older compared to younger workers) by this adjustment to the denominator because the

for purposes of evaluating potential undercounting in the two recessions. Since Farber was unable to differentiate his PSID correction factor by age because of limited sample size, we are unable to determine whether there are any observable differences between our two age groups in his correction.

¹¹Farber (1997) uses all three years. Our definition of job loss, and thus our findings, differ substantially from those of Farber. Using his formulation, we have been able to replicate his displacement rates by age, occupation, and industry for the 1984 and 1994 DWS's.

¹²Our displacement rates are thus defined by age at the time of the survey, not at the time of displacement, which is unknown. Actual age of displacement is therefore two to three years below our reference ages.

proportion of displaced workers not employed at the time of the survey varied differentially by age over the period of our analysis. Thus the upward bias in the displacement rates of older and younger workers from omitting these former workers would have influenced changes in relative job loss rates over time.¹³

Any remaining mismeasurement due to our inclusion in the denominator of workers employed at the time of the survey but not at risk of job loss during the recall period is likely to impart a bias against our findings of an increased share of job loss among older workers in the 1990's. Workers who left jobs voluntarily during the recall period may be unemployed at the time of the survey and thus not included in our denominator. Quit rates, however, are generally higher in times of strong employer demand and are therefore likely to have been higher among young workers in the 1990's contraction than in the earlier, more severe, recession. In this case, the imparted upward bias in the displacement rate of younger workers (due to the smaller denominator) would be larger in the latter period, understating the decline in job loss rates of younger workers over time and thus understating the deterioration in the relative position of older workers.

We examine changes in the relative job loss rates of older and younger workers at comparable phases of the 1980's and 1990's business cycles, the recessions of 1981-82 and 1990-91. The recession in the early 1980's began at the peak in GDP in July 1981 and reached a trough

¹³Re-employment rates of displaced older male workers differed little between the recessions of the early 1980's and 1990's (54 percent and 58 percent, respectively). Re-employment rates of displaced younger male workers, however, were considerably higher in the 1990's recession than in the earlier period (73 percent compared to 60 percent). In a measure of job loss including only displaced workers re-employed at the time of the survey, the decline over time in job loss among younger workers would be exaggerated, overstating the deterioration in the relative position of older workers.

in November 1982.¹⁴ The shorter contraction in the early 1990's began from the peak in GDP in July 1990 and reached a trough in March 1991. Because of the timing of the DWSs (1992 and 1994) and our use of two-year displacement periods to avoid including temporary layoffs, only the two-year periods of 1989-90 and 1991-92 were available to capture the slack market of the early 1990's. The former was a period of strong expansion up to the peak in economic activity in July 1990. In contrast, growth was sluggish from the trough in March 1991 through early 1992. The labor market was tight in 1989-90, with unemployment remaining below 5 percent, but slack in 1991-92, with unemployment rising to a peak of 7 percent in 1992. The overall displacement rate was also higher in 1991-92. For these reasons we use 1991-92 to represent the 1990's contraction.¹⁵

4. THE SHIFTING BURDEN OF JOB LOSS

Table 1 presents two-year displacement rates of full-time workers aged 20-64 from 1981-82 to 1995-96. Job loss, shown for all workers and separately by gender, follows the business cycle. Overall rates decline from 6.7 percent in 1981-82 to 3.9 percent in the mid-1980s, rise to 5.6 percent in 1991-92 and decline to 4 percent in 1995-96.

Job loss among men is at its highest level, 7.7 percent, in the 1981-82 recession. Displacement then falls in the early stages of the expansion to 5.2 percent, declines further to a

¹⁴We follow National Bureau of Economic Research designations of business cycles and Bureau of Economic Analysis, U.S. Department of Commerce, quarterly measures of gross domestic product in making these determinations.

¹⁵The increase in relative job loss of older workers between the two recessions is significant at the 1 percent level using either period to measure the 1990's contraction. The coefficient of change is about one-third larger using the later period.

low of 4.2 percent by the latter part of the expansion, and rises to 6.2 percent in 1991-92. The rate then falls steadily to 4.1 percent in 1995-96.

The pattern of job loss among full-time female workers is also cyclical but the amplitude of the changes is smaller than that of male workers. Women's displacement rates are lower than those of men throughout the period, starting from a high of 5.3 percent in 1981-82, declining gradually to 3.5 percent in the latter part of the expansion, rising to 4.8 percent during the later recession, then falling to 3.9 percent by 1995-96. Interestingly, displacement rates fall relatively less for women than for men from the recent recession into the expansion (from 1991-92 to 1995-96) compared to the earlier period (1981-82 to 1987-88), so that by 1995-96, women's rates are nearly identical to those of men.¹⁶

There are also important gender differences when job loss is disaggregated by age. The cyclical pattern in job loss among all full-time workers masks an important shift in the incidence of job loss between younger and older men that does not occur among women (Table 2; Figures 1 and 2). Displacement rates of both older and younger men decline sharply, about 30 percent, from their highest levels in the 1981-82 recession to 1983-84, the beginning of the 1980's expansion. They then decline again (about 15-20 percent) to 1987-88.¹⁷ Rates of older men then rise sharply in the recession that follows, nearly doubling by 1991-92; in contrast, rates of

¹⁶The differential impact of the recent expansion on men's and women's displacement poses one of the more interesting puzzles regarding job loss during the 1990's.

¹⁷In mid-expansion (1985-86), the downward trend in job loss is halted briefly. The displacement rate among older workers increases and there is a narrowing of the differential between the two age groups. The overall pattern during the expansion, however, is one of nearly proportional declines in displacement rates of the two age groups (Figure 1). In 1987-88, the job loss rate of older workers is 31 percent lower than the rate of younger workers, compared to 38 percent lower in 1981-82.

younger men rise by only one-quarter, equalizing the incidence of job loss. In the expansion that follows, displacement rates decline together.

Two conclusions emerge from these trends. First, the deterioration in the position of older men over this 15-year period was for the most part a *relative* change. Displacement rates of older male workers rose 16 percent from the earlier to the later recession, but this increase was overshadowed by the large decrease (31 percent) in the rates of younger workers. Second, the decline in the relative position of older men occurred during a very short time span: the period immediately before and during the 1991-92 recession. From the 1981-82 recession, job loss rates of the two age groups declined in tandem to the end of the expansion.¹⁸ Rates then increased sharply among older men, while moving up much more moderately among younger men. This finding suggests that the causes of the change in relative job loss among men may be specific to this short period of economic slowdown rather than to longer-term shifts in the economy such as changes in technology or market structure.¹⁹

Job loss among full-time female workers over this period is markedly different. Displacement rates of older women remain lower than those of younger women throughout the period (Table 2; Figure 2). During the 1981-82 recession, job loss among women aged 45-59 is 4.4 percent compared to 5.7 percent among women aged 25-39. The relative rates of the two age groups remain within a narrow band ranging from this initial difference of 1.3 points to a 0.5

¹⁸This pattern is repeated in the 1990's expansion, which does not support the media's focus on the uneven incidence of downsizing in the mid-1990's.

¹⁹For findings on the latter, see Rodriguez and Zavodny (2000). By comparing change in relative job loss between the expansionary periods of 1983-87 and 1993-97, however, this analysis misses the sharp reversal in relative job loss from the latter part of the 1980's expansion through the 1990-91 recession.

differential in 1995-96 (rates of 3.6 and 4.1 percent respectively). In contrast to job loss among men, displacement rates of women in both age groups follow a smooth cyclical pattern throughout the period.

We next examine the magnitude and statistical significance of the change over this period in the relative incidence of job loss among older and younger male workers (Table 3). We measure this change by comparing the relative job loss rate (the difference in displacement rates) of older and younger men in the 1991-92 recession with the relative rate in the 1981-82 recession; that is, we examine the difference-in-differences. This comparison of periods of similar macroeconomic activity removes the influence on measured job loss of unobserved age-specific differences in worker behavior in different stages of a business cycle.²⁰ Table 2, moreover, indicates that the larger change in relative job loss occurred between the two recessions rather than between the two expansions: relative displacement established during each recession is maintained in the subsequent expansion. We compare the change in relative job loss between recessions among women as well. Although Table 2 and Figure 2 indicate that the relative positions of younger and older women remained fairly constant overall, we find some changes over time when job loss is examined at a disaggregated level.

In Table 3, we see that in the 1981-82 recession, the difference between the displacement rates of older and younger men is large (3.3 percent) and statistically significant. In the later recession, the rates are indistinguishable. The difference between these two relative rates, the

²⁰Faced with the prospect of job loss, younger workers may make pre-emptive moves even in slack labor markets, thus reducing observed job displacement; older workers, assuming more limited opportunities, may do so only in tight markets. Bias may remain if age-specific differences in worker behavior within a phase of the cycle changed between the two decades, however.

difference-in-differences, is large and significant at the 1 percent level.²¹ Among women, the within-year differences are significant but nearly identical, so that the difference-in-differences in job loss between the two recessions is negligible.

Relative Job Loss by Education

We next use the difference-in-differences framework to examine job loss in the 1981-82 and 1991-92 recessions by level of education, occupation, and industry. We are interested in determining whether the increased share of job loss borne by older men in the later recession is concentrated among particular groups of workers. Among women, we are interested in whether the stability we see in relative job loss overall is also evident when we disaggregate by a number of demographic characteristics. Table 4 presents differences between the two recessions in the relative displacement rates of younger and older workers by education. We classify workers into four categories: high school dropout, high school graduate, college attendee, and college graduate.²² We see in Table 4 that differences among men in relative job loss rates between the two recessions are large and significant at all education levels with the exception of high school

²¹The difference-in-differences (DID) = $[DR_{O,91-92} - DR_{Y,91-92}] - [DR_{O,81-82} - DR_{Y,81-82}]$, where DR denotes displacement rate, O is 45-59 year-old age group, Y is 25-39 year-old age group, 91-92 denotes the 1991-92 recession, and 81-82 denotes the 1981-82 recession. The standard error of the difference in displacement rates is computed as $\sqrt{(\text{var}(a) + \text{var}(b) - \text{cov}(a,b))}$, where $\text{cov}(a,b)$ is unknown but assumed positive within and between years. Comparison of these standard errors and the standard errors of coefficients in a regression equivalent of Table 3 indicates marginal differences but no changes in significance levels. We use difference-in-differences analysis in our initial examination of relative job loss because the regression framework does not easily accommodate comparison of relative job loss across detailed education, occupation and industry categories. We confine our summary regressions to a broad occupational classification.

²²Beginning with the 1990 Census and January 1992 Current Population Survey, the Bureau of the Census altered the focus of the educational-attainment question from years of education to degree attained. We use the recoding strategy developed in Jaeger (1997) to reconcile old and new classifications.

dropouts. The largest change from the 1981-82 recession occurs for high school graduates. In the earlier recession, the displacement rate of young men is 5.6 percentage points higher than that of older men; by 1991-92, the rates are essentially identical. Among college graduates, the difference in job loss in 1981-82 is smaller, but in the later recession the rates of older men are significantly higher than those of younger workers.²³ Among women, in contrast, the higher displacement rates of younger women in 1981-82 persist in 1991-92 so that differences-in-differences are uniformly insignificant.

Relative Job Loss by Occupation

We next examine differences between the two recessions in relative job loss by occupation (Table 5). Among men, the largest change occurs among blue-collar workers -- crafts workers, operators, and laborers -- and service workers, a dramatic shift over time that has escaped public attention.²⁴ In 1981-82, the displacement rate of younger crafts workers, operatives, and laborers is nearly twice that of older workers, 12.5 percent compared to 7.2 percent. In the later recession, the rate of younger workers is still higher but not statistically different from that of older workers. The change among service workers exhibits the same pattern.

There are also important differences between the two recessions in two of the three broad white-collar categories. The differences-in-differences both for sales and administrative support and for managers and administrators are large and highly significant. In both categories, job loss

²³By 1995-96, however, rates of older and younger male college graduates are equal.

²⁴Neumark, Polsky, and Hansen (1999) find significant declines in job retention rates among blue-collar workers between 1983-87 and 1987-91, but no significant changes among service workers during this period.

rates of younger workers are higher than those of older workers in 1981-82 and lower in 1991-92.²⁵ Interestingly, rates of younger and older professional and technical workers are identical in both periods.

Among women, crafts workers, operators, and laborers are the only occupational group to experience a significant age-related shift in displacement between the two recessions. Both the pattern of change and the magnitude of the difference-in-differences are identical to those of men. Displacement rates of younger women are significantly higher than those of older women in 1981-82 and nearly identical in 1991-92. Curiously, this significant occupational change among women is only weakly reflected in changes in relative job loss among high school dropouts and graduates shown in Table 4. We examine this puzzling finding below in regression analyses of occupational differences in relative job loss by education. We find that there is not a simple one-to-one relationship between job loss by educational attainment and occupational status, and that the pattern differs by gender.

Over the 15-year period from the early 1980's recession to the mid-1990's (not reported in Table 5), displacement rates of younger men decline monotonically among blue-collar workers but follow a different pattern in management/administration and sales/administrative support, the other occupations in which the relative positions of older and younger workers reversed over this period. Job loss moves counter-cyclically among young managers and administrators and

²⁵Farber (1997) suggests that the rise in job loss among managers/administrators in the early 1990's recession represented a one-time adjustment by employers. Disaggregated by age, however, displacement rates of both older and younger managers and administrators had each undergone a significant previous adjustment. Rates of older managers and administrators increased from 3.3 percent in 1981-82 to 4.5 percent by the mid-1980's, and rates of younger managers and administrators declined from 4.9 percent in 1981-82 to 3.8 percent in the same period.

stepwise among sales and administrative support workers (rates are high and constant during the 1980's and significantly lower and steady throughout the 1990's). These differences suggest that explanations for the changes in the relative positions of younger and older workers over this period may differ for white and blue-collar occupations, and possibly may differ within these two broad categories.

Relative Job Loss by Industry

Lastly, we examine differences in relative job loss in the 1981-82 and 1991-92 recessions by industry (Table 6). Among men, the largest changes in relative job loss occur in wholesale trade (difference-in-differences is 5.4 percent), non-professional services (5.2 percent), construction (4.3 percent), and durable manufacturing (4.3 percent).²⁶ Displacement rates of younger workers in these industries are significantly higher than those of older workers in 1981-82. In wholesale trade, non-professional services and construction, the rates of younger and older workers are not significantly different in 1991-92. In durable manufacturing, rates of younger workers are higher in 1991-92 but by a much smaller margin than in the earlier recession.

Changes in relative job loss are also significant in nondurable manufacturing and, in the service-producing industries, in transportation, communications and public utilities, retail trade, and finance, insurance and real estate.

Among women, none of the differences-in-differences by industry are significant. It thus appears that the deterioration in the relative position of older female crafts workers, operators, and laborers was diffused across industries. Surprisingly, the displacement rate of younger

²⁶We exclude agriculture, forestry and fishing, mining, and public administration because samples are small.

women in wholesale trade in 1991-92 is nearly twice as high as in the earlier recession, while the rate of older women does not change. This increase in job loss of younger women contrasts with the decline in job loss among younger men in this industry. It appears that in the 1991-92 recession, younger men replaced both older men and younger women in wholesale trade.

Regression Analysis

Finally, we estimate probit regressions to examine the relationship between education and occupation in job loss and to control for heterogeneity in the effects of race, region, and cohort in the two recessions (Tables 7 and 8).²⁷ We account for potential changes over this period in worker behavior and in the degree of discrimination that may have influenced displacement rates differentially between older and younger nonwhite workers, and in regional differences in the age distribution of job loss that may have occurred because the geographical impact of the two recessions differed. We also control for differences unrelated to age in the cohorts comprising the two age groups. Potential cohort differences are important because the two recessions not only share some birth-year cohorts but these cohorts are aged 35-39 in the earlier recession and 45-49 in the later recession. Characteristics particular to these cohorts are thus reflected in job

²⁷Coefficients are normalized to represent the derivative of the probability of displacement with respect to a change in the explanatory variable. This is computed as $\beta \cdot \phi(\beta' \bar{x}) / \Phi(\beta' \bar{x})$ where β is the vector of estimated parameters of the probit model, \bar{x} is the vector of means of explanatory variables, and Φ is the standard normal probability density function. Huber-White standard errors are in parentheses. Regressions are estimated separately by level of educational attainment and are weighted by adjusted CPS sampling weights. We adjust weights in the 1981-82 and 1991-92 samples by dividing the weight for each observation by the sum of the weights in each sample. Without this adjustment, the larger weights in the 1991-92 sample, reflecting population growth since 1981-82, and the smaller sample used in the CPS in 1994 (and in subsequent years) would give undue influence in the regression to the later period.

loss rates of younger workers in the 1981-82 recession but in rates of older workers in the 1991-92 recession.²⁸

The effect of race on job loss differs by gender in an unusual pattern. Race has no effect on displacement rates at any education level among men (Table 7), but among women (Table 8), displacement of non-whites is higher for high school dropouts but lower for college graduates. Regional effects also differ by gender and educational attainment. Among high school dropouts, there are no regional differences among women, but male displacement is significantly higher in the midwest and west.²⁹ Among high school graduates, displacement rates are highest for both men and women in the west. Job loss among college attendees is highest in the northeast for men but highest in the midwest for women. Among college graduates, job loss is highest in the west for women; among men, it is significantly lower in the midwest.

Having controlled for potential age-related differences in job loss by race, region, and cohort, we now examine differences between younger and older workers (relative job loss) in the two recessions. We focus in particular on differences by occupation because we are interested in changes that may have occurred between low- and high-skilled workers. While a regression framework based on interaction effects does not conveniently accommodate the detailed

²⁸These overlapping cohorts were born in 1945-49, a period of low birth rates compared to the decade that followed. We would thus expect relatively low job loss for this small group, all else equal, which would depress displacement rates of younger workers in the earlier recession and older workers in the later recession. If unaccounted for, these cohort influences would understate the shift in the burden of job loss to older workers in the later recession. We observe lower displacement rates (not reported in Tables 7 and 8) for some birth years among male high school graduates and college attendees and female college attendees but the pattern is not uniform. Birth-year cohort effects evaluated as a group are significant at the 10 percent level for female high school dropouts and college grads and marginally significant (13 percent) for male high school dropouts.

²⁹South is the omitted region.

occupational breakdown examined earlier in the univariate analysis, Tables 7 and 8 reveal that a blue-collar/white-collar distinction provides powerful insights into the changing pattern of job loss.

The difference between the two recessions in relative job loss -- the difference-in-differences (DID) in the univariate analysis -- is shown in Tables 7 and 8 for blue-collar workers by the coefficient of $Older*1990s$, the interaction between $Older$ (the 45-59 year-old group) and $1990s$ (the 1991-92 recession).³⁰ The coefficient of $Older$ indicates the difference in job loss rates between older and younger blue-collar workers in 1981-82. The coefficient of $1990s$ indicates the difference in job loss rates of younger blue-collar workers between 1981-82 and 1991-92. The interaction term, $Older*1990s$, thus measures the additional effect of being an older blue-collar worker in the 1991-92 recession. A positive coefficient indicates that displacement rates of older blue-collar workers were higher relative to those of younger workers in 1991-92 than in 1981-82.

The coefficient of $WC*Older*1990s$ indicates the difference between the DID's of white-collar and blue-collar workers; that is, it measures the additional effect of being a white-collar worker. The DID of white-collar workers, therefore, is the sum of this coefficient and the coefficient of $Older*1990s$.³¹

³⁰The reference group for interaction effects is blue-collar workers aged 25-39 in 1981-82. We include service workers with blue-collar workers. Workers in service occupations, unlike those in the services industries, are concentrated at the lower end of the earnings distribution (Hipple 1999).

³¹The sum of the coefficients of $Older*1990s$ and $WC*Older*1990s$ is computed as the sum of the two estimated parameters, each of which is multiplied by N , the standard normal probability density function. The variance of the sum is equal to the square of N multiplied by the sum of the variance of each coefficient plus their covariance. The standard error of the sum is the square root of the variance.

We see in the first column of Table 7 that relative job loss rates of male high school dropouts do not differ in the two recessions for either blue- or white-collar workers. The coefficient of Older*1990s , the DID of blue-collar workers, is small and insignificant, and the coefficient of WC*Older*1990s , the difference in the DID's of white- and blue-collar workers, is small and of opposite sign. The sum of these coefficients, the DID of white-collar workers, is near zero and insignificant.³²

The picture is very different for male high school graduates. The coefficient of Older*1990s (+.063) indicates that displacement rates of older blue-collar workers were significantly higher relative to those of younger workers in 1991-92 than in 1981-82. This result is surprising, insofar as the later recession is commonly perceived to have been a white-collar recession. A coefficient of WC*Older*1990s close to zero (that is, not different from the coefficient of Older*1990s) implies that relative job loss among white-collar workers changed as well, however. The sum of these two coefficients (+.057), the DID of white-collar workers, is significant at the 5 percent level. The deterioration in the relative position of older male high school graduates in the 1990's recession, that is, was of the same magnitude for blue- and white-collar workers.

The pattern for men with some college education deviates from that of high school graduates insofar as older blue-collar college attendees experienced an even greater relative change over time in job loss than white-collar college attendees. The coefficient of Older*1990s (+.115), the DID of blue-collar college attendees, is nearly twice that of the coefficient of blue-collar high school graduates discussed above (+.063). The relative position of older blue-collar

³²The DID's of white-collar workers are reported in the text but not included in Tables 7 and 8.

workers with some college education, in other words, deteriorated more in the 1990's recession than that of older blue-collar high school graduates. The coefficient of WC*Older*1990s (-.055), the difference in the DID of white-collar workers, is negative and significantly smaller (at the 10 percent level) than the coefficient of Older*1990s. The DID of white-collar college attendees (+.060), the sum of these two coefficients, is about the same magnitude as the DID of white-collar high school graduates and is significant (at the 10 percent level). Thus, among workers with some college education, the deterioration over time in the relative position of older blue-collar workers was even greater than that of older white-collar workers.

Among male college graduates, the coefficient of Older*1990s, the DID of blue-collar workers, is positive but not statistically significant.³³ The coefficient of WC*Older*1990s, however, is also positive and not significantly different from the coefficient of Older*1990s. The sum of the two coefficients (+.054), the DID of white-collar workers, is significant at the 1% level, indicating that older white-collar college graduates experienced a significant deterioration in their relative position in the 1991-92 recession. Table 5 suggests that this decline, as well as that experienced by older white-collar workers with less education, was concentrated among managers and administrators and workers in sales and administrative support, but did not extend to professional and technical workers. These findings concerning white-collar workers coincide with the public's understanding of the impact on older male workers of the 1991-92 recession.

Among women, there are no significant differences in relative job loss in the two recessions among high school dropouts, high school graduates, or college graduates (Table 8).

³³This finding is unlikely to be the result of small numbers. The sample of male college graduates includes 1,032 blue-collar workers, 11 percent of the total.

Neither the coefficients of Older*1990s, reflecting the DID's of blue-collar workers, nor the sums of these coefficients and the coefficients of WC*Older*1990s, reflecting the DID's of white-collar workers, are significant for these education groups. The failure to find significant declines for blue-collar high school dropouts and graduates is surprising because of the large difference in relative job loss among female crafts workers, operatives, and laborers shown in Table 5. This difference is reflected instead, however, in the DID of blue-collar workers with some college education, the only education/occupation cell that is significant for women. The coefficient of Older*1990s (+.071) is large and significant. It appears therefore that the deterioration in the relative position of blue-collar workers in the 1991-92 recession was experienced among men by both high school graduates and those with some college education, but among women by college dropouts exclusively.

5. CONCLUSION

A number of conclusions emerge from this study. First, with the exception of male college graduates, the deterioration in the position of older men from the severe 1981-82 recession to the mild downturn in the early 1990's was *relative*. Displacement rates of older male workers increased over the period, but this change was overshadowed by the large decrease in the rates of younger workers.

Second, and our most striking finding, is that the largest changes over time in the relative position of older workers were not in white-collar occupations, which captured public attention, but among high school graduates and those with some college education working in blue-collar occupations, men and women alike. Public perception was not entirely unfounded, however,

because older male white-collar workers, from high school to college graduates, also suffered a deterioration in their relative position over the period.

We find no racial disparities in job loss among male workers, but nonwhite women who did not graduate from high school experienced higher rates of displacement. Nonwhite female college graduates, in contrast, had substantially lower displacement rates.

Overall, older workers retained the favorable position they held relative to younger workers in the 1981-82 recession well into the expansion of the mid-1980's. By 1989-90, however, displacement rates of older workers had risen sharply while those of younger workers increased only moderately. In 1991-92, job loss among older workers was identical to that of younger workers. These findings suggest that the more important clues to understanding this dramatic shift in the incidence of job loss may be found in this brief period of economic slowdown rather than in long-term trends in the economy.

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Table 1. Job Loss Rates of Full-Time Workers, 1981-1996

Ages 20-64

	<u>Total</u>	<u>Men</u>	<u>Women</u>
1981-82	.067	.077	.053
1983-84	.048	.052	.041
1985-86	.046	.052	.038
1987-88	.039	.042	.035
1989-90	.053	.058	.047
1991-92	.056	.062	.048
1993-94	.046	.050	.042
1995-96	.040	.041	.039

Source: Authors' tabulations of data from Displaced Worker Supplements of 1984, 1986, 1988, 1990, 1992, 1994, 1996, and 1998. All cell counts and displacements are weighted by CPS adult final weights. Standard errors are less than .002.

Table 2. Job Loss Rates of Full-time Workers by Age, 1981-96
(standard errors)

	<u>Males</u>		<u>Females</u>	
	<u>25-39</u>	<u>45-59</u>	<u>25-39</u>	<u>45-59</u>
1981-82	.087 (.003)	.054 (.003)	.057 (.003)	.044 (.003)
1983-84	.060 (.002)	.039 (.003)	.046 (.002)	.038 (.003)
1985-86	.057 (.002)	.047 (.003)	.042 (.002)	.030 (.003)
1987-88	.048 (.002)	.033 (.002)	.037 (.002)	.030 (.003)
1989-90	.061 (.002)	.053 (.003)	.050 (.002)	.043 (.003)
1991-92	.060 (.002)	.063 (.003)	.053 (.003)	.044 (.003)
1993-94	.051 (.002)	.050 (.003)	.047 (.003)	.039 (.003)
1995-96	.040 (.002)	.040 (.003)	.041 (.002)	.036 (.003)

Source: Authors' tabulations of data from Displaced Worker Supplements of 1984, 1986, 1988, 1990, 1992, 1994, 1996, and 1998. All cell counts and displacements are weighted by CPS adult final weights.

Table 3. Differences Between Recessions in Relative Job Loss Rates of Full-Time Workers
(standard errors)

	<u>Males</u>			<u>Females</u>		
	<u>25-39</u>	<u>45-59</u>	<u>Diff</u>	<u>25-39</u>	<u>45-59</u>	<u>Diff</u>
1981-82	.087 (.003)	.054 (.003)	-.033 (.004)	.057 (.003)	.044 (.003)	-.014 (.004)
1991-92	.060 (.002)	.063 (.003)	.004 (.004)	.053 (.003)	.044 (.003)	-.010 (.004)
Difference			.036 ^a (.006)			.004 (.006)

Source: Authors' tabulations of data from Displaced Worker Supplements of 1984 and 1994. All cell counts and displacements are weighted by CPS adult final weights. Rounding accounts for disparities in differences. Superscript ^a denotes significance at the 1% level for differences-in-differences.

**Table 4. Differences Between Recessions in Relative Job Loss Rates By Education
Full-Time Workers**
(standard errors)

	<u>Males</u>			<u>Females</u>		
	<u>25-39</u>	<u>45-59</u>	<u>Diff</u>	<u>25-39</u>	<u>45-59</u>	<u>Diff</u>
<u>Dropouts</u>						
1981-82	.102 (.008)	.078 (.007)	-.024 (.011)	.096 (.011)	.060 (.008)	-.036 (.013)
1991-92	.059 (.008)	.059 (.009)	-.001 (.012)	.061 (.011)	.049 (.010)	-.013 (.014)
Difference			.023 (.016)			.023 (.020)
<u>12th Grade</u>						
1981-82	.108 (.005)	.052 (.005)	-.056 (.007)	.066 (.004)	.044 (.005)	-.022 (.006)
1991-92	.060 (.004)	.057 (.005)	-.003 (.007)	.057 (.004)	.046 (.005)	-.011 (.006)
Difference			.054 ^a (.010)			.011 (.009)
<u>Some College</u>						
1981-82	.095 (.006)	.052 (.007)	-.043 (.009)	.061 (.005)	.045 (.008)	-.016 (.010)
1991-92	.072 (.005)	.074 (.007)	.002 (.008)	.062 (.005)	.052 (.006)	-.010 (.008)
Difference			.045 ^a (.012)			.006 (.012)
<u>College Graduates</u>						
1981-82	.050 (.004)	.030 (.005)	-.020 (.006)	.030 (.004)	.017 (.005)	-.013 (.006)
1991-92	.047 (.004)	.063 (.006)	.016 (.007)	.038 (.004)	.029 (.005)	-.009 (.006)
Difference			.035 ^a (.009)			.004 (.009)

Source: Authors' tabulations of data from Displaced Worker Supplement of 1984 and 1994. All cell counts and displacements are weighted by CPS adult final weights. Rounding accounts for disparities in differences. Superscript ^a denotes significance at the 1% level for differences-in-differences.

**Table 5. Differences Between Recessions in Relative Job Loss Rates By Occupation
Full-Time Workers**
(standard errors)

	<u>Males</u>			<u>Females</u>		
	<u>25-39</u>	<u>45-59</u>	<u>Diff</u>	<u>25-39</u>	<u>45-59</u>	<u>Diff</u>
<u>Managers/Admin</u>						
1981-82	.055 (.006)	.038 (.006)	-.017 (.009)	.055 (.008)	.050 (.011)	-.005 (.014)
1991-92	.057 (.007)	.076 (.008)	.018 (.010)	.059 (.007)	.062 (.009)	.003 (.011)
Difference			.035 ^a (.014)			.008 (.018)
<u>Prof/Technical</u>						
1981-82	.041 (.004)	.036 (.006)	-.005 (.008)	.024 (.003)	.010 (.004)	-.014 (.005)
1991-92	.049 (.005)	.052 (.007)	.004 (.009)	.031 (.004)	.017 (.004)	-.014 (.005)
Difference			.008 (.012)			-.000 (.007)
<u>Sales/Admin Support</u>						
1981-82	.059 (.005)	.050 (.007)	-.009 (.009)	.050 (.004)	.043 (.005)	-.008 (.006)
1991-92	.044 (.005)	.071 (.008)	.027 (.009)	.060 (.004)	.048 (.005)	-.012 (.007)
Difference			.035 ^a (.013)			-.005 (.009)
<u>Service</u>						
1981-82	.051 (.009)	.019 (.007)	-.032 (.011)	.034 (.006)	.024 (.006)	-.010 (.009)
1991-92	.048 (.008)	.051 (.011)	.003 (.014)	.034 (.006)	.025 (.006)	-.009 (.008)
Difference			.035 ^b (.018)			.001 (.012)

Table 5. Differences Between Recessions in Relative Job Loss Rates By Occupation (cont.)

	<u>Males</u>			<u>Females</u>		
	<u>25-39</u>	<u>45-59</u>	<u>Diff</u>	<u>25-39</u>	<u>45-59</u>	<u>Diff</u>
<u>Crafts/Oper/Laborer</u>						
1981-82	.125 (.005)	.072 (.005)	-.053 (.007)	.142 (.010)	.085 (.010)	-.057 (.014)
1991-92	.069 (.004)	.059 (.005)	-.010 (.006)	.084 (.009)	.076 (.010)	-.008 (.013)
Difference			.043 ^a (.009)			.049 ^b (.019)

Source: Authors' tabulations of data from Displaced Worker Supplements of 1984 and 1994. All cell counts and displacements are weighted by CPS adult final weights. Rounding accounts for disparities in differences. Superscripts ^a and ^b denote significance at the 1% and 5% levels for differences-in-differences.

**Table 6. Differences Between Recessions in Relative Job Loss Rates By Industry
Full-Time Workers**
(standard errors)

	<u>Males</u>			<u>Females</u>		
	<u>25-39</u>	<u>45-59</u>	<u>Diff</u>	<u>25-39</u>	<u>45-59</u>	<u>Diff</u>
<u>Goods Producing Industries</u>						
<u>Construction</u>						
1981-82	.113 (.009)	.087 (.012)	-.026 (.016)	.150 (.032)	.154 (.048)	.003 (.057)
1991-92	.091 (.009)	.108 (.014)	.017 (.017)	.135 (.037)	.118 (.043)	-.017 (.057)
Difference			.043 ^c (.023)			-.020 (.081)
<u>Durable Mfg</u>						
1981-82	.140 (.007)	.077 (.007)	-.063 (.010)	.130 (.011)	.092 (.013)	-.038 (.017)
1991-92	.087 (.007)	.067 (.007)	-.020 (.010)	.107 (.012)	.087 (.013)	-.020 (.018)
Difference			.043 ^a (.014)			.018 (.025)
<u>Nondurable Mfg</u>						
1981-82	.072 (.007)	.060 (.008)	-.012 (.011)	.119 (.011)	.082 (.012)	-.037 (.016)
1991-92	.042 (.006)	.059 (.009)	.017 (.011)	.077 (.010)	.070 (.012)	-.007 (.015)
Difference			.029 ^c (.016)			.030 (.022)
<u>Trans, Com, Pub Ut</u>						
1981-82	.061 (.007)	.036 (.006)	-.025 (.009)	.043 (.009)	.034 (.013)	-.009 (.015)
1991-92	.040 (.006)	.043 (.007)	.003 (.009)	.037 (.009)	.044 (.012)	.007 (.015)
Difference			.028 ^b (.013)			.016 (.021)

Table 6. Differences Between Recessions in Relative Job Loss Rates By Industry (cont.)

	<u>Males</u>			<u>Females</u>		
	<u>25-39</u>	<u>45-59</u>	<u>Diff</u>	<u>25-39</u>	<u>45-59</u>	<u>Diff</u>
<u>Wholesale Trade</u>						
1981-82	.092 (.011)	.053 (.012)	-.039 (.016)	.054 (.014)	.114 (.032)	.060 (.035)
1991-92	.070 (.010)	.085 (.016)	.015 (.019)	.099 (.018)	.102 (.025)	.003 (.031)
Difference			.054 ^b (.024)			-.058 (.047)
<u>Service Producing Industries</u>						
<u>Retail Trade</u>						
1981-82	.043 (.006)	.054 (.010)	.011 (.011)	.059 (.008)	.039 (.009)	-.02 (.012)
1991-92	.048 (.005)	.089 (.012)	.042 (.013)	.074 (.007)	.060 (.010)	-.013 (.012)
Difference			.031 ^c (.017)			.007 (.017)
<u>Fin, Insur, Real Est</u>						
1981-82	.024 (.006)	.009 (.005)	-.015 (.008)	.027 (.006)	.030 (.009)	.002 (.011)
1991-92	.033 (.008)	.047 (.012)	.014 (.014)	.035 (.006)	.031 (.008)	-.004 (.010)
Difference			.029 ^c (.016)			-.006 (.015)
<u>Nonprof Services</u>						
1981-82	.103 (.010)	.064 (.013)	-.039 (.017)	.063 (.009)	.026 (.009)	-.037 (.013)
1981-92	.062 (.007)	.074 (.013)	.012 (.015)	.083 (.010)	.073 (.013)	-.010 (.016)
Difference			.052 ^b (.022)			.027 (.021)

Table 6. Differences Between Recessions in Relative Job Loss Rates By Industry (cont.)

	<u>Males</u>			<u>Females</u>		
	<u>25-39</u>	<u>45-59</u>	<u>Diff</u>	<u>25-39</u>	<u>45-59</u>	<u>Diff</u>
<u>Prof Services</u>						
1981-82	.020 (.004)	.013 (.004)	-.008 (.005)	.014 (.002)	.010 (.003)	-.003 (.003)
1991-92	.024 (.004)	.028 (.005)	.004 (.007)	.017 (.002)	.017 (.003)	.000 (.004)
Difference			.012 (.008)			.004 (.005)

Source: Authors' tabulations of data from Displaced Worker Supplements of 1984 and 1994. All cell counts and displacements are weighted by CPS adult final weights. Rounding accounts for disparities in differences. Superscripts ^a, ^b and ^c denote significance at the 1%, 5% and 10% significance levels for differences-in-differences.

Table 7. Estimates of the Probability of Male Job Loss By Education
Full-Time Workers
(robust standard errors)

Variable	Dropouts	12th Grade	Some College	College Graduates
Older	.022 (.032)	-.044 ^c (.023)	-.113 ^a (.030)	-.062 ^b (.031)
1990s	-.042 ^b (.020)	-.059 ^a (.011)	-.055 ^a (.014)	-.003 (.015)
Older*1990s	-.001 (.032)	.063 ^a (.021)	.115 ^a (.030)	.042 (.035)
WC	-.013 (.021)	-.051 ^a (.010)	-.059 ^a (.011)	-.045 ^a (.010)
WC*Older	.004 (.030)	.035 ^b (.017)	.062 ^a (.024)	.021 (.025)
WC*1990s	.042 (.039)	.046 ^a (.016)	.045 ^a (.015)	.005 (.015)
WC*Older*1990s	.003 (.056)	-.006 (.025)	-.055 ^c (.031)	.012 (.033)
Nonwhite	.009 (.011)	-.006 (.008)	.003 (.010)	-.004 (.008)
Northeast	-.010 (.011)	.002 (.007)	.016 ^c (.009)	.001 (.006)
Midwest	.025 ^b (.010)	.005 (.007)	.001 (.009)	-.011 ^c (.007)
West	.020 ^c (.011)	.020 ^a (.008)	.013 (.009)	-.001 (.007)
Constant	-.205 (.034)	-.151 ^a (.024)	-.130 ^a (.026)	-.145 ^a (.023)
N	4585	11860	7989	9404
Log likelihood	-1205.029	-3038.1571	-2118.243	-1781.3552
Pred P	.070	.068	.072	.045

Source: Probit regressions using Displaced Worker Supplements of 1984 and 1994. Regressions are weighted by adjusted CPS adult final weights. The dependent variable equals one if the individual was displaced two to three years before the survey date and zero otherwise. Coefficients are normalized to represent the derivative of the probability of displacement with respect to a change in the explanatory variable. Equations control for birth year. The reference group for interaction effects is blue-collar workers aged 25-39 in 1981-82. Superscripts ^a, ^b and ^c denote significance at the 1%, 5% and 10% levels.

Table 8. Estimates of the Probability of Female Job Loss by Education
Full-Time Workers
(robust standard errors)

Variable	Dropouts	12th Grade	Some College	College Graduates
Older	-.025 (.035)	-.019 (.021)	-.019 (.031)	-.031 (.032)
1990s	-.025 (.025)	-.034 ^a (.013)	-.063 ^a (.016)	-.023 (.018)
Older*1990s	.014 (.035)	.021 (.022)	.071 ^b (.033)	.027 (.039)
WC	.015 (.018)	-.033 ^a (.009)	-.052 ^a (.011)	-.054 ^a (.012)
WC*Older	-.004 (.026)	.015 (.015)	.006 (.026)	.019 (.026)
WC*1990s	.017 (.030)	.024 ^c (.013)	.059 ^a (.017)	.045 ^a (.018)
WC*Older*1990s	-.037 (.045)	.003 (.021)	-.046 (.033)	-.034 (.035)
Nonwhite	.025 ^b (.012)	.002 (.007)	-.006 (.008)	-.015 ^b (.006)
Northeast	.011 (.013)	-.001 (.007)	.000 (.008)	.003 (.005)
Midwest	.012 (.013)	.004 (.007)	.014 ^c (.008)	-.006 (.006)
West	.013 (.013)	.013 ^c (.007)	.011 (.008)	.014 ^b (.005)
Constant	-.184 ^a (.046)	-.140 ^a (.024)	-.121 ^a (.025)	-.097 ^a (.020)
N	2670	9914	6769	6801
Log likelihood	-625.67939	-2068.6942	-1447.2928	-899.4308
Pred P	.057	.052	.053	.026

Source: Probit regressions using Displaced Worker Supplements of 1984 and 1994. Regressions are weighted by adjusted CPS adult final weights. The dependent variable equals one if the individual was displaced two to three years before the survey date and zero otherwise. Coefficients are normalized to represent the derivative of the probability of displacement with respect to a change in the explanatory variable. Equations control for birth year. The reference group for interaction effects is blue-collar workers aged 25-39 in 1981-82. Superscripts ^a, ^b and ^c denote significance at the 1%, 5% and 10% levels.

Figure 1. Male Job Loss Rates (logarithmic) by Age, 1981-1995



○ = 25-39 Years of Age

△ = 45-59 Years of Age

Figure 2. Female Job Loss Rates (logarithmic) by Age, 1981-1995



○ = 25-39 Years of Age △ = 45-59 Years of Age