

# Career Trajectories and Older Men's Retirement

Mark D. Hayward,<sup>1</sup> Samantha Friedman,<sup>2</sup> and Hsinmu Chen<sup>3</sup>

<sup>1</sup>Pennsylvania State University, University Park.

<sup>2</sup>New York University School of Law, New York.

<sup>3</sup>National Chengchi University, Taipei, Taiwan, Republic of China.

*The idea of a long and stable career rewarded by retirement is a fixture of the American social ethos and political economy. The paradox is that many Americans' careers do not fit this image. Here, we examined how the structure of the career, as compared to only those circumstances proximate to retirement, is important for understanding career endings. Based on labor force histories drawn from the National Longitudinal Survey of Older Men, we observed that the occupational roles held through the mid and late career combine additively to influence retirement and disability experiences, with different conditions of work coming into play depending on the career stage. Occupational roles in the mid career also have long-term, indirect effects, operating through the onset of health problems and the adequacy of pension benefits. Although retirement and disability are not hinged to occupational mobility per se, these career endings are sensitive to major discontinuities in the career and work role in terms of unemployment and labor force mobility.*

THE idea of a long and stable career rewarded by retirement is a fixture of the American social ethos and political economy. Individuals regard retirement as a right or natural consequence of a lifetime of work commitment. Private pension systems, especially guaranteed benefit plans, reinforce this belief by rewarding employment tenure. Social Security pension benefits also reward stable careers, basing benefit levels on earnings from contiguous quarters of labor force participation. The fact that retirement is regarded as a natural part of the career is due in part to the mutual advantages that workers, employers, and the state accrue through lower turnover (and its costs) and increased productivity by workers.

The paradox is that the work careers of many Americans do not fit this image. Over their careers, workers frequently change jobs both within and between firms (e.g., DiPrete & Krecker, 1991). A significant number of Americans also experience unemployment at some point in their work lives (Hachen, 1992; Siegel, 1993). Workers experience both losses and gains in the circumstances and rewards associated with their jobs (e.g., Blau & Duncan, 1967; Tolbert, 1982). Although these experiences are age-patterned with substantially greater mobility occurring early in the career, mobility remains an important aspect of the career even among middle-aged and older workers (e.g., Spenner, 1988a; Tolbert, 1982).

This discrepancy between the ideal career and many Americans' experiences points to the important role the work career has in producing variation in the timing and character of the work-to-retirement transition. Here, we investigate the alternative ways in which work careers potentially influence career endings. Special attention is given to the trajectories of occupational *incumbency* and *career mobility*. As we demonstrate below, career endings are linked both to the patterning of occupational roles held over the career and to major discontinuities in the work role. Trajectories indicative of career advancement magnify ties to the

labor force, reducing retirement chances. Conversely, trajectories showing low levels of attainment weaken workers' bonds to the labor force, increasing retirement chances.

## THEORETICAL BACKGROUND

How careers end and the timing of career endings are a reflection of the stratification of occupational achievement (Hayward, Grady, Hardy, & Sommers, 1989; Hayward, Hardy, & Liu, 1994). Jobs with little autonomy, mundane work tasks, and high physical demands propel workers out of the labor force through retirement and disability. The disruption of the work role through unemployment hastens the end of the work career. These late-life work circumstances index the attractiveness of continued work activity and the demand for older workers. It is axiomatic, however, that older workers are rarely "born into" those positions held late in life. For most workers, these positions are the outcomes of a lifetime of career achievement. The general question for this study is whether only the person's current work circumstances are relevant to predict retirement behavior, or whether retirement also is sensitive to earlier career experiences and thus patterned by both current and earlier work circumstances. If the latter is true, then knowledge of the *structure* of careers is important for understanding retirement.

Although most prior research has focused on contextualizing career endings in terms of late-life work circumstances, there are both substantive and theoretical reasons to suspect more far-reaching career effects. For example, empirical evidence contradicts the commonly held notion that older workers experience little career mobility. Among a sample of men aged 55–59 during the 1966–1981 period, over 20% changed employers and approximately 35% changed occupations. Of those who changed occupations, the proportions moving upward and downward in terms of occupational status were roughly equal (Tolbert, 1982). This same pattern holds at a highly aggregate level. At least

a quarter of older incumbents in 1-digit census occupational categories moved to other occupations. The volume of movement ranged from 29% of professionals to 54% of nonfarm laborers (Parnes & Less, 1985). The key lessons for this study are that (a) there is considerable variation in the age-vulnerability of careers, and (b) older workers are heterogeneous in terms of how they arrived in their occupational positions. To show that retirement differs by current occupation is no guarantee that retirement is in fact prompted by the immediate work environment. The full consequences of occupational achievement must be sought by tracing the effects of occupational positions held throughout the career (Elder & Pavalko, 1993).

Neither prior research nor current theory provides a clear standard of how to model the effects of a career on retirement behavior. We approach the development of a theoretical framework with several goals in mind. First, it is important to identify the effects of specific qualities of the work career to understand the mechanisms connecting career endings with career achievement. Second, given the dynamics of careers, it is important to separate the effects of the immediate work environment from prior circumstances to assess whether one or both influences retirement. Third, it is necessary to consider how occupational positions combine over the career to influence career endings.

These goals are rooted in Spilerman's (1977) definition of a career. Individuals' career achievements are determined, in part, by career lines, the properties of which include entry portals, number of available positions, and transfer opportunities to better (or worse) jobs or alternative career lines. These properties are age-patterned, which accounts for the sequence of jobs individuals hold over the career. These sequences, in turn, determine career trajectories of job qualities and rewards. Comparisons of job qualities for different points in the career can be used to make inferences about career advancement or unraveling.

Traditionally, career achievement has been indexed by sociologists in terms of occupational status. In studying the consequences of occupational position for individuals, however, the use of a single global measure such as occupational status does not lend itself to sorting out the mechanisms by which the achievement of social positions affects some outcome such as retirement. This study follows the research tradition of Kohn and Schooler (e.g., 1983) and adopts the premise that the structural conditions of work rather than the status assigned to work mediate the effects of social position on retirement. Phrased in terms of the research problem stated above, retirement is hypothesized to be an outcome of the career trajectory where the trajectory references the conditions of work over the career.

The conditions of the work environment are referenced in terms of structural imperatives (i.e., factors defining the day-to-day qualities of work activity; Kohn & Schooler, 1983; Spenner, 1988b, p. 72). These imperatives include (a) occupational self-direction (e.g., the substantive complexity of work, closeness of supervision, and routinization); (b) job pressures (e.g., strength demands and environmental conditions); (c) extrinsic rewards and risks (e.g., the risk of unemployment, employment regulations, and earnings); and (d) position in the organizational structure (e.g.,

ownership, and supervisory status). All four dimensions of the work environment have been linked to the retirement process (e.g., Hayward et al., 1989). Retirement rates are elevated for persons in jobs with low self-direction (e.g., jobs with low levels of complexity, authority and high levels of routinization) and considerable job pressures (e.g., jobs which are physically and environmentally demanding). Retirement also is affected by the job's extrinsic rewards and risks (e.g., generous pension benefits and compulsory retirement regulations increase retirement rates) and position in the organizational structure (e.g., retirement rates are low among self-employed persons compared to persons working in larger bureaucratized firms). Retirement is embedded in the organization of work. Here, we amend this idea by inserting temporal structure into the relationship. We consider how retirement is embedded in the organization of work *over the career*.

Although little research has examined career effects on retirement (an important exception is the work of Elder & Pavalko, 1993), related research suggests that occupational positions in both mid and late life influence career endings, with different structural imperatives coming into play depending on the career stage. This body of research suggests, for example, that imperatives such as substantive complexity and physical and environmental demands have the greatest effect in the later stages of the career (e.g., Spenner, 1988a), whereas mid career effects accrue from the job's extrinsic rewards and risks and position in the organizational structure (e.g., Mutran & Reitzes, 1989; Quinn, Burkhauser, & Myers, 1990; Ruhm, 1991).

The importance for retirement of structural imperatives experienced in the late career is based partly on the empirical observation that some work conditions, especially conditions reflecting the substantive complexity of work and job pressures, show increased variability in the mid to late career as workers continue to be sorted (or sort themselves) into jobs. As variability in substantive complexity occurs over the career, for example, so do the opportunities for adult intellectual and personal development (Spenner, 1988a). Substantively complex environments provide older workers with the opportunities to practice or exercise their intellectual abilities. Practice in later life generates greater benefits in terms of maintaining one's level of ability compared to younger ages (i.e., the lack of exercise is more harmful at older ages). Retirement-aged workers in substantively complex jobs thus are more likely to maintain their intellectual abilities and interests in their jobs compared to same aged workers in less complex jobs, accentuating occupational differences in both the value of older workers to employers and older workers' own evaluation of work and non-work alternatives. The strongest effects of substantive complexity on retirement, therefore, should come from those jobs held as persons move into the prime retirement ages. We also expect that the physical and environmental demands from jobs held late in the career are likely to elevate retirement. Workers' age-related declines in health are likely to magnify the challenges of these job pressures.

We expect that the structural imperatives of mid career occupations operate principally through the traditional explanatory factors of retirement: health status and pension

characteristics. Health is sensitive to working conditions such as substantive complexity and physical and environmental demands. Occupations lacking complexity or characterized by high levels of job stress have higher rates of mortality (Moore & Hayward, 1990) and heart disease (e.g., Karasek, Theorell, & Schwartz, 1988; Karasek, 1990). Greater physical and environmental demands also elevate the chances of mortality (Behrman, Sickles, & Taubman, 1990; Moore & Hayward, 1990), musculoskeletal disorders and impaired working capacity (Östlin, 1988), and heart disease (Johnson, Hall, & Theorell, 1989; Karasek et al., 1988). The long-term consequences of these working conditions, then, may be health-mandated career exits at older ages.

Workers' retirement pensions stem from extrinsic rewards and risks and the worker's position in the organizational structure (O'Rand, 1986; O'Rand & MacLean, 1986). Extrinsic rewards and risks include the chances of unemployment, employment rules and regulations, and earnings. Over the course of the career, extrinsic rewards and risks give rise to earnings trajectories and job tenure. Earnings trajectories influence pension benefit levels, and job tenure governs private pension eligibility. Illustrative of positional effects is the contrast in pension wealth stemming from careers developed inside and outside large bureaucratic firms. Bureaucratic firms are capable of supporting private pension programs. Self-employed persons, in contrast, bear the brunt of accumulating private pension wealth through personal savings and higher Social Security taxes because there is no employer contribution. This latter factor negatively affects private pension wealth by constraining discretionary savings. Self-employment over the major part of the career therefore is likely to delay retirement.

The dynamic quality of the career makes it important to consider how career endings are related to trajectories indicative of a bettering or worsening of working conditions (Elder & Pavalko, 1993). Careers can unravel through job loss or a worsening of working conditions through downward occupational mobility. Career building can occur via improvements in working conditions. Career unraveling at older ages is expected to reduce older workers' preference for continued work, especially given the availability of retirement options defined by public and private pension systems. Career building at older ages is expected to have the opposite effect. Here, an improvement in working conditions is likely to heighten older workers' preference for continued work, although there are clearly diminishing returns with age.

Occupational moves denoting a worsening of work conditions thus are expected in increased retirement rates, whereas moves to better working conditions are expected to have the opposite effect. The greater the magnitude of change in working conditions, *ceteris paribus*, the greater the impact on retirement rates. For example, moves resulting in less self-direction and greater pressures are expected to increase the risk of retirement, net of an individual's position, since such moves potentially signal career unraveling. We also consider the possibility that events signaling unraveling may influence retirement indirectly by impairing health status and reducing access to and/or the real value of pensions.

#### DATA AND VARIABLES

This study is a cohort-based prospective analysis of the National Longitudinal Survey (NLS) of Older Men. The NLS is a nationally representative sample of men aged 45–59 in 1966 ( $N = 5,020$ ) interviewed annually or biennially until 1983. The NLS was designed to map the labor force experiences of middle-aged men as they entered the prime retirement ages. The 1966–1983 observation period spans an important period in retirement research. Although most of the post-WWII decline in men's labor force participation rates occurred prior to this period (Hayward, Crimmins, & Wray, 1994; Tuma & Sandefur, 1988), the organization of the retirement transition underwent significant changes. Retirement rates escalated as did reentry rates, causing a contraction in the main career and an expansion of post-retirement labor force activity for both men and women (Hayward, Crimmins, & Wray, 1994; Hayward, Grady, & McLaughlin, 1988a, 1988b). These organizational changes were prompted in part by the liberalization of public and private pension plans and the increased respectability of retirement in the population (Parnes & Less, 1985), general conditions that remain part of the fabric of today's retirement decision making.

On entering this period, 34% of the NLS cohort identified a white-collar occupation as their longest job (Parnes & Less, 1985, p. 14). The bulk of the cohort's long-term employment at this point was concentrated in craft and laborer occupations, 24 and 20% respectively, with 13% of the cohort reporting farm occupations as their longest job. This latter estimate of farm employment as the longest job is doubtlessly unique to this cohort compared to more recent cohorts given the long-term historical decline in farm employment over this century. Very little change occurred in employment mobility as the cohort moved through the 1970s and into the 1980s despite both economic boom and bust cycles—as noted above roughly 80% of men aged 55–59 years reported working with the same employer at the beginning and end of three 5-year intervals spanning the observation period (Parnes & Less, 1985, p. 18). Somewhat higher volumes of occupational mobility were reported for these ages, though occupational stability over a 5-year interval declined only marginally from 63 to 59%. Despite both improvements and declines in occupational status by individuals over the observation period, overall levels of occupational upgrading continued as the cohort entered the prime retirement years. Particularly evident was the growth of men working in managerial occupations among white-collar workers, the heavy decline in farm employment with the dispersal of workers into other blue-collar jobs, and the growth of service employment fueled by men leaving operative and laborer occupations.

The NLS cohort is unique in at least one other important respect compared to current and future cohorts of persons facing retirement. During most of the observation period, relatively few older women had lifelong work careers, and those women who did were concentrated in a handful of occupations. The NLS men's retirement decisions, therefore, are more typically framed in terms of "his" labor market experiences and rewards rather than some combination of husbands' and wives' characteristics. Among the more re-

cent cohorts of workers approaching retirement, however, women's greater access to private pensions and a higher prevalence of lifelong work careers has elevated both the importance of considering women's retirement in its own right and the imperative of framing both men's and women's retirement decisions within the larger context of the household (e.g., Henretta, O'Rand, & Chan, 1993).

The analysis here rests on the subsample of men observed to be in the labor force at some point during the 17-year observation period. This restriction allows us to accurately identify the "at risk" population and to establish covariate values temporally prior to exiting the labor force. Those men in 1966 not in the labor force and who never reenter are excluded from this analysis. Histories of labor force behavior are constructed based on men's movements out of, and perhaps back into, the labor force over the observation period. Should individuals exit and then reenter the labor force, they rejoin the retirement risk set. An individual's history ends at the age at which he left the survey either through death or attrition. The histories are compiled into an exposure interval file where the interval is one year in length. All exposure intervals are defined such that individuals are on average exact age  $x$  (e.g., 62.0) at the beginning of an interval, and events (including censoring) are assumed to occur in the middle of the interval. Censoring refers to individuals in the risk set who leave observation because of sample attrition or death prior to being observed to exit the labor force. In all, the subsample generated 41,356 exposure intervals of observation.

The work-to-retirement experiences of workers are defined in terms of changes in labor force status over the 1-year exposure interval. The NLS allows us to determine the age at which persons exited the labor force and whether the exit was mandated by the inability to work (i.e., disability). Persons employed or looking for work in the survey week are classified as being "in the labor force." Persons not currently working and not looking for work are classified as being "out of the labor force." Disability is based on respondents' reports that they are *unable* to work for health reasons. Nondisabled persons out of the labor force are labeled heuristically as retired.

The operational definition of retirement is an unsettled issue (Ekerdt & DeViney, 1990). An alternative approach is to use self-identification (e.g., do individuals define themselves as retired?), although this sometimes confuses labor supply with a social identity. In addition to labor force exit and self-identification, other possible criteria include pension receipt, separation from a career job, and reduced work effort. Cross-classification on these criteria shows considerable overlap among men—though no comparable analyses are available for women (e.g., 75–85% of men are consistently classified across multiple criteria), and alternative definitions typically have no effect on the substantive results (e.g., Diamond & Hausman, 1984; Palmore, Burchett, Fillenbaum, George, & Wallman, 1985). Multiple criteria are sometimes used to define retirement status. However, multiple criteria introduce difficulties in making inferences about *when* events happen because criteria need not share the same temporal paths. Here, our reliance on labor force status in combination with the inability to work

provides the means to identify the cessation of work. Information on part-time work and prior labor force exits are included as explanatory covariates to link exiting events with reduced work effort and labor force mobility.

The total number of retirement and disability events in our sample is 3,632 and 491, respectively. Because of missing data, the number of events in the analysis reduces to 3,564 retirements and 462 disability exits. The problems of missing data are minimized largely by imputing missing values using a hot deck imputation routine. Procedures are described in detail in Moore and Hayward (1990). Despite using an imputation procedure, some missing data still resulted because of an insufficient number of cases with valid values matching the characteristics of the missing case.

A disproportionate share of retirement and disability exits are single career ending events. Of all the retirement events, approximately 74% reference the only retirement event in a person's life (although substantial numbers of retirees reenter the labor force and perhaps exit through death or disability); 95% of disability exits reference the only disability event.

The distinction between retirement and disability as reasons for exiting the labor force is important for several reasons. First, disability explicitly references health-mandated labor force exits (i.e., persons report being unable to work for health-related reasons), and is thus a largely involuntary act. Although health status may prompt a person to retire (e.g., Hayward et al., 1989), the retiree, unlike a disabled worker, is nonetheless capable of working. Second, and related to this first point, different processes govern these events (e.g., Hayward et al., 1989). A range of factors influence the retirement decision including occupation, health status, pension wealth, income, education, and self-employment. A much narrower set of factors directly influences disability (e.g., health status and income) with the occupational position held proximate to disability only playing a major role indirectly through an individual's wages (Hayward et al., 1989).

The longitudinal quality of the NLS makes it possible to characterize career mobility during the later stages of the career, since information on occupation, unemployment, and employer changes is collected at each observation wave. Information about the longest job (e.g., occupation and tenure) and the first job after the completion of school also is available at baseline, providing markers of achievement spanning the entire career. The NLS contains items measuring the traditional determinants of retirement such as financial information, health, pension coverage, and demographic characteristics. Table 1 shows the variables used in the analysis.

The fourth edition of the *Dictionary of Occupational Titles* (DOT) is used to measure the nature of work in the occupation. The DOT is the major source of information regarding the nature of jobs in the U.S. The DOT provides measures of 46 characteristics on training time, aptitudes, interests, physical demands, working conditions, industry, and work performed. Prior work (Hayward & Grady, 1986) has developed four factors summarizing these characteristics for 1960 detailed occupational codes—the codes used in the NLS: substantive complexity, physical and environ-

Table 1. Description of Covariates Used in the Analyses

Variable	Description
Age	Chronological age beginning at 45.
Race	Race (non-White = 1; White = 0).
Education	Education is defined as the highest grade completed (1 = less than 12 years; 2 = 12 years; 3 = 13–15 years; 4 = 16 or more years).
Marital Status	Marital status and wife's health status (1 = married, wife's health limits work; 2 = married, wife's health does not limit work; 3 = widowed; 4 = divorced/separated; 5 = never married).
Region	Region of residence (1 = South; 0 = non-South).
Housing Tenure	Did the respondent own/rent his house/apt? (1 = owned or being bought; 2 = rented; 3 = no cash rent/other)
SMSA	Residence in SMSA (1 = central city of SMSA; 2 = balance of SMSA/not in central city; 3 = not in SMSA)
Dependents	Number of dependents, excluding wife, living in the household.
Unemployment Rate	Annual national unemployment rate.
Inflation Rate	Annual national inflation rate.
Manipulative Skills	This is a multi-item DOT-based scale representing the degree to which work in the occupation involves working with things and requires aptitudes such as motor coordination, finger dexterity, and eye-hand-foot coordination.
Physical/Environmental Demands	This is a multi-item, DOT-based scale indicating the physical demands and environmental hazards of the occupation.
Substantive Complexity	This is a multi-item, DOT-based scale reflecting the degree to which work involves handling data, the training requirements of the occupation, whether the work is abstract and creative, and the degree to which work is repetitive.
Social Skills	This is a multi-item, DOT-based scale that identifies whether work involves dealing with people and whether or not it requires the physical capabilities of talking, hearing, and seeing.
Job Tenure	Number of years worked for last or current employer.
Class of Worker	Class of worker (1 = private; 2 = government; 5 = self-employed)
Unemployment Spells	Number of prior unemployment spells (0 = none; 1 = one; 2 = two; 3 = three or more)
Labor Force Exits	Number of prior labor force exits (0 = none; 1 = one; 2 = two or more)
Compulsory Retirement	Was there a compulsory retirement regulation in the worker's pre-retirement job? (0 = no; 1 = yes)
Pension Coverage	Pension Coverage (0 = no pension coverage; 1 = missing; 2 = Social Security only; 3 = eligible for other benefits only; 4 = eligible for both Social Security and other benefits)
Hourly Pay	Estimated Ln (Hourly Pay) of current or last job; prediction equation includes age, age squared, region, health limitations, job tenure, occupational status, education, race, marital status, SMSA residence, annual unemployment rate, and period. Estimates assigned to both self-employed and wage and salaried workers.
Employment Status	Employment Status and hours worked (0 = working, but missing on hours/zero hours worked; 1 = part-time, 1–19 hours per week; 2 = part-time, 20–34 hours per week; 3 = full-time, 35 or more hours per week; 4 = unemployed)
Health Status	Does health limit the kind/amount of work? (0 = no; 1 = yes)

Note: SMSA = Standard Metropolitan Statistical Area.

mental demands, social skill requirements, and manipulative skill requirements. The substantive complexity factor corresponds closely to Spennner's definition of occupational self-direction. Occupations ranking high on substantive complexity involve working with data, require extensive training, and are characterized by abstract, creative, and nonrepetitive work. The other three factors reference different types of job pressures. The manipulative skills factor represents the extent to which work in an occupation involves working with things and requires aptitudes such as motor coordination, finger dexterity, and eye-hand-foot coordination. The physical and environmental demands factor taps strength requirements and usual physical activities (e.g., stooping, kneeling, climbing) as well as the environmental conditions surrounding the work activity (e.g., temperature, presence of fumes, etc.). The social skills factor references the extent to which work involves dealing with people and whether or not it requires the physical capabilities of talking, hearing, and seeing. How the DOT factors differentiate the quality of work and the work environment across major occupational groups is shown in Table 2,

which reports the mean values of the scales for 1-digit census occupations.

The DOT information is assigned to NLS respondents based on their 3-digit occupational code. As persons change occupations over the observation period, new DOT information is assigned to reflect the changes in the work environment. This results in a set of occupational histories profiling mid and late career changes in the substantive complexity of work, physical and environmental demands, social skill requirements, and manipulative skill requirements. Because historical information is not available on the changing nature of work within occupations, we assume that an occupation's ranking relative to other occupations on these dimensions does not vary significantly over the observation period.

Other time-varying measures of the structural imperatives shown in Table 1 are taken directly from self reports. Measures of the extrinsic rewards and risks include the number of prior unemployment spells and labor force exits observed since baseline, compulsory retirement regulations, predicted hourly earnings, and pension coverage. A measure of part-

Table 2. Mean DOT Factor Scores for 1-Digit Census Occupations (1960 Classification Scheme)

Occupational Group	Substantive Complexity	Manipulative Skill	Physical & Environmental Demands	Social Skills
Professionals	1.153	-0.147	-0.122	0.138
Managers	0.599	-1.063	-0.615	0.934
Clerical	-0.550	-0.393	-0.791	-0.306
Sales	-0.140	-0.798	-0.724	1.126
Crafts	0.037	0.838	0.964	-0.504
Operatives	-1.052	0.084	0.333	-0.842
Service	-0.806	-0.209	0.526	0.417
Farmers	0.521	-0.342	2.050	-1.008
Farm laborers	-1.078	-0.344	1.508	-0.784
Laborers	-1.358	-0.734	1.220	-0.810

time versus full-time employment (and unemployment) is included to capture the marginality of older workers' work attachment. Information is available to measure job tenure indicating the level of employment stability. We measure position in the organizational structure using information on the respondent's class of worker status. This allows us to discriminate between employed persons in the private and government sectors from self-employed workers.

#### METHOD

Our prior discussion makes clear the importance of specifying a model that includes indicators of the structural imperatives experienced over the career. Career events also are integral to understanding retirement by virtue of the fact that events sometimes involve *changes* in the nature of work or the interruption of the career through unemployment and labor force status changes. The model's basic form is taken from the work of Mare (1990) and Moore and Hayward (1990). This approach expands the traditional static notion of occupation to encompass both longest and latest occupation to distinguish the effects of the current work environment from older workers' main occupational work experience. The form of this model also is designed to control for possible (negative and positive) retirement selection effects. For example, as discussed previously, effects of the current occupation could potentially be attributed both to the effects of exposure or to some type of retirement-related selection into the occupation. After earlier socioeconomic statuses are controlled, however, the net effect of the current occupation is relatively purged from selectivity effects (Mare, 1990, p. 366).

Here, the longest occupation is measured at baseline, while the latest occupation is measured from 1966 until the respondent left observation. Given the number of occupations individuals potentially hold over the career, our focus on the longest and latest occupations is necessarily a simplifying strategy. Attention to the longest occupation when respondents were 45–59, however, has certain conceptual merits because it taps the notion of the main career occupation prior to entry into the prime retirement ages.

Our basic analytic model takes the following elementary form.

$$\ln(h_{ij}(t)) = \beta_0 + \gamma AGE + \beta_m Z + \beta_n W(t) + \beta_o U(t) + \beta_k X(t) + \beta_i Y(t) + \beta_p Z * W(t) + \beta_q U(t) * W(t)$$

$Z$  is a vector of occupational characteristics pertaining to the person's longest occupation, including indicators of substantive complexity, physical demands, and environmental conditions.  $W(t)$  is a vector of time-dependent occupational characteristics comparable to  $Z$  pertaining to the latest occupation.  $U(t)$  is a vector of time-dependent career event characteristics referencing mobility in and out of the labor force, unemployment, and employer changes between 1966 and 1983.  $X(t)$  is a vector of time-dependent covariates indexing traditional retirement determinants such as health status and pension coverage. And  $Y(t)$  is a vector of individual measures referencing sociodemographic and background characteristics, some of which are time dependent. The dependent variable in this model is the (log of the) risk of a retirement or disability, where the risk refers to the instantaneous probability of an event occurring at time  $t$ .

The parameters,  $\beta_m$  and  $\beta_n$ , represent the main effects of occupational incumbency over the mid and later portion of the career on the (log of the) risk of retirement or disability. If both estimates are statistically significant, support is indicated for the idea that occupational positions in both mid and late life pattern career endings, net of factors such as unemployment, prior labor force mobility, and so on. Occupational mobility or the change in occupational environments is captured through a set of interaction terms,  $\beta_p$ . The vector of parameter estimates,  $\beta_o$ , further identifies the effects of career mobility or discontinuity as reflected by unemployment and movements in and out of the labor force. Finally, based on the parameter estimates,  $\beta_q$ , we assess whether occupational effects change surrounding mobility events. For example, we test explicitly whether the effect of occupational environmental conditions changes *after* a person has already experienced retirement and subsequently reentered the labor force.

The analysis begins by estimating a reduced form model including the explanatory variables indexing the characteristics of the longest job and the sociodemographic and family background characteristics. The reduced form model allows us to assess the total effect of occupational incumbency in the longest job (net of the sociodemographic factors). Then, the vectors referencing current occupational conditions and career mobility events are included in the model. Finally, the full model introduces the traditional retirement determinants, health status and pension coverage. Comparisons of the full model with earlier models provide the means to assess the indirect effects of career structure through the traditional retirement determinants.

A pseudo continuous-time hazard modeling approach is used to estimate the models. Hierarchical model tests of alternative baseline hazard functions indicate that a third order, polynomial function provides the best fit for both the retirement and disability events.

#### FINDINGS

To better understand how career structures influence career endings, we begin by examining the frequency of oc-



occupational mobility at the end of the career. The row mobility counts shown in Table 3 are based on person-years of exposure. The frequencies illustrate that both advancement and attainment are common features of older men's careers. On average, 42% of exposure in the late career is spent in occupations other than the longest occupation (the sum of the off-diagonal elements divided by total exposure). This basic pattern holds regardless of whether mobility is constrained to only pre-retirement experiences (estimates not shown) or whether the full span of late life activity is considered. Occupational mobility is not an infrequent occurrence for many older workers. Employment mobility is also not an unusual occurrence. Prior to exiting the labor force, approximately 38% of exposure is spent in a different firm from that reported for the longest job (estimates not shown). Employment mobility occurs both for those who remain occupational stable as well as for those changing

occupations, although employer mobility is more strongly associated with occupational changes (in both directions) than occupational stability.

The highest rate of occupational retention is among professionals (71%), reflecting both the attractiveness of work and the fact that downward mobility is the only alternative. The lowest rates of retention are found in the farm and non-farm laborer occupations (43% and 46%, respectively). Well over half of the exposure for workers in these occupations is spent elsewhere before the end of the career. It is not surprising that most mobile workers do not move very far, staying within the blue-collar/white-collar boundaries—a finding similar to Blau and Duncan's (1967) research on younger workers.

To assess whether occupational origins (i.e., the longest occupation in 1966) are associated with the occupational destinations of older workers, we calculated crude ratios of

Table 3. Occupational Mobility During Mid to Late Career

Occupation of Longest Job	Occupation of Current Job										Total
	White-Collar				Blue-Collar						
	1	2	3	4	5	6	7	8	9	10	
1. Professionals	2,781 <sup>a</sup>	565	115	86	164	94	41	44	2	9	3,901
	179 <sup>b</sup>	39	18	7	14	10	6	7	1	2	283
	10 <sup>c</sup>	1	2	2	0	1	0	1	0	0	17
2. Managers	328	2,712	147	577	479	175	138	34	2	41	4,633
	25	178	15	56	40	22	18	7	0	2	363
	0	19	4	1	5	3	1	1	1	0	35
3. Clerical	149	283	1,159	95	212	137	117	18	2	87	2,259
	14	26	93	14	16	18	8	2	2	3	196
	2	3	9	1	3	1	2	0	0	0	21
4. Sales	83	518	36	866	64	40	62	6	0	24	1,699
	6	23	5	53	3	4	3	0	0	2	99
	0	2	0	10	0	0	2	0	0	0	14
5. Crafts	252	829	237	109	6,083	846	325	97	42	290	9,110
	24	72	18	15	495	87	39	10	5	34	799
	1	9	1	0	50	9	2	2	0	9	83
6. Operatives	118	483	289	115	1,387	5,051	676	70	119	796	9,104
	14	46	31	18	134	418	63	8	15	95	842
	0	3	1	1	16	60	16	3	5	16	120
7. Service	73	142	107	17	147	222	1,367	19	12	116	2,222
	7	17	11	1	14	21	103	1	4	13	192
	0	1	2	0	2	2	22	1	0	1	31
8. Farmers	51	181	75	101	351	418	236	2,410	287	356	4,466
	5	15	4	9	35	46	26	189	49	33	411
	2	4	0	1	8	12	4	33	6	5	75
9. Farm Laborers	16	8	14	4	118	219	147	77	603	206	1,412
	1	0	2	0	14	24	10	2	66	19	138
	0	1	0	0	2	3	3	1	11	6	27
10. Laborers	47	82	112	12	346	671	428	28	65	1,509	3,300
	6	9	10	1	30	62	46	3	5	137	309
	1	2	1	0	10	11	5	2	1	35	68
Totals	3,898	5,803	2,291	1,982	9,351	7,873	3,537	2,803	1,134	3,434	42,106

<sup>a</sup>The first number listed within each cell represents the number of exposure years.

<sup>b</sup>The second number listed within each cell represents the number of retirement events.

<sup>c</sup>The third number listed within each cell represents the number of disability events.

the observed frequencies to expected ratios based on the assumption of independence (e.g., Blau & Duncan, 1967). The ratios are calculated using the information shown in Table 3. For example, the ratio for retention in professional occupations is calculated as: (cell frequency/row marginal frequency)/(column marginal frequency/total frequency) =  $(2,781/3,901)/(3,898/42,106) = 7.7$ . These calculations were done both for the matrix shown in Table 3 and a pre-retirement mobility matrix, and the pattern of results was almost identical (results not shown although the estimates are available on request). It is not surprising that occupational inheritance (i.e., the expected ratios in the diagonal of the matrix exceeded 1.0) was greater than expected for all of the occupational groups. However, despite the amount of exposure in the off-diagonal cells, the effects of the longest occupation on upward and downward mobility were not especially strong. A total of eight out of ninety off-diagonal cells (four cells denoting upward mobility and four denoting downward mobility) had a stronger than expected relationship. Thus, a substantial amount of mobility in the late career does *not* appear to be patterned by the longest occupation. Among white-collar workers, downward mobility was exemplified by professionals moving into managerial positions, and managers moving into sales occupations. Men in sales occupations, however, also moved into managerial positions at a relatively high rate. Among blue-collar workers, upward mobility occurred by laborers moving into operative and service occupations, and farm laborers moving into service positions. Farm laborers also moved into laborer occupations. Other cases of downward mobility were farmers moving into farm laborer occupations and operatives moving into laborer occupations.

The frequency of retirement and disability events also is shown in the occupational cross-classification in Table 3. One common pattern is that downward mobility is associated with higher rates of retirement (i.e., number of events within a cell divided by the exposure within a cell). Less clear is whether the converse also is true. Upward mobility is not associated consistently with lower retirement rates. If anything, upward mobility is associated with slightly higher retirement rates. While one must be cautious about inferring too much from these data, the patterns suggest that occupational mobility, whether upward or downward, increases retirement rates. Occupational stability, except among farm laborers, extends the overall length of work life.

Disability rates are highest for blue-collar workers compared to white-collar workers. The highest disability rates are for laborers followed by farm laborers and service workers. The off-diagonal elements are difficult to evaluate given the sparse data, but downward mobility seems to be associated with a higher rate of disability. Examples include men exiting craft occupations for jobs as operatives or laborers, and operatives moving to service positions.

The multivariate models provide the explicit tests of the alternative hypotheses of career structure effects. We focus first on the results showing how the structural imperatives, occupational self-direction and job pressures, combine over the career to affect exiting behavior. As shown in Table 4, the results for the additive models indicate that these occupational features influence both retirement and disability,

although different features come into play depending on the career stage. As hypothesized, net of the longest occupation, the substantive complexity and physical demands of the current occupation significantly influence the risk of retirement (see Model 3). Men approaching retirement in jobs allowing little autonomy, whose tasks are relatively boring and mundane, and who work in physically demanding jobs have elevated risks of retirement. These same features of the longest job, however, have no independent effect. These characteristics of the work environment thus come into play directly only in jobs held proximate to the retirement event.

More surprising is the finding that persons whose longest occupation involved significant personal communication and dealing with people (e.g., teachers, postal clerks, insurance agents, managers, and sales workers) showed lower rates of retirement net of the characteristics of the current occupation (see Models 1, 2, and 3). The specific mechanism is ambiguous, although several post hoc explanations are plausible. These types of occupations, for example, impose few barriers for older workers and may imbue workers with a general type of human capital providing a range of opportunities in the late career. Alternatively, these types of occupations may foster strong work-based social networks or social capital which increase workers' long-term ties to the workplace. Both arguments are consistent with the crude estimates that can be gleaned from Table 3. There, managerial occupations, which rank very high in social skill requirements, have very low rates of retirement (crude rate = .073 compared to the overall crude rate of .086). So, too, do individuals who work in sales occupations continuously in the late career (crude rate = .061).

Turning to how these structural imperatives affect disability, the results suggest generally that self-direction reduces the chances of a health-mandated exit. Model 1 implies long-term effects; Model 2 implies more immediate effects. And, when current health status is introduced in Model 3, changes in the parameter estimate of substantive complexity illustrate that low levels affect a health-mandated exit through health limitations developed on the job. This finding reinforces a growing body of research linking autonomy and creativity in the work environment to individuals' health and functioning (Moore & Hayward, 1990; Johnson et al., 1989; Karasek, 1990; Karasek, Gardell, & Lindell, 1987).

Model 1 also suggests that the physical and environmental demands in the longest occupation elevate the chances of disability. Indeed, this is the job factor that most commonly comes to mind as a precursor of disability. However, after characteristics of the current occupation and labor force mobility are controlled, the physical and environmental demands of the longest job no longer have a significant effect. The surprise here is the lack of a dominant effect—either long-term or short-term—of physical and environmental demands on disability.

Although disability is not sensitive to physical and environmental demands, manipulative skill requirements in both the longest and current jobs have substantial effects. Manipulative skill requirements in the longest occupation reduce the chances of disability (Models 1, 2, and 3), a result consistent with a practice or exercise effect where re-



Table 4. Nested Models of Career Effects on Retirement and Disability (Standard errors in parentheses)

Variable Name	Model 1		Model 2		Model 3	
	Retirement	Disability	Retirement	Disability	Retirement	Disability
Age	-10.7957** (0.6800)	-13.6252** (4.5050)	-10.8424** (0.6866)	-14.0653** (4.4941)	-11.2734** (0.6906)	-14.7743** (4.4991)
Age <sup>2</sup>	0.1874** (0.0114)	0.2551** (0.0815)	0.1888** (0.0116)	0.2635** (0.0813)	0.1953** (0.0116)	0.2776** (0.0814)
Age <sup>3</sup>	-0.0011** (0.0001)	-0.0016** (0.0005)	-0.0011** (0.0001)	-0.0016** (0.0005)	-0.0011** (0.0001)	-0.0017** (0.0005)
Race (non-White is ref.)	0.0628 (0.0647)	0.2041 (0.1757)	0.0756 (0.0651)	0.2422 (0.1771)	-0.0584 (0.0722)	0.3531† (0.2004)
Education (highest grade completed)						
Less than 12 years	0.1145** (0.0431)	0.4327** (0.1326)	0.0844** (0.0434)	0.3886** (0.1337)	0.1580** (0.0465)	0.2765† (0.1440)
12 years	ref.	ref.	ref.	ref.	ref.	ref.
13–15 years	-0.0200** (0.0679)	-0.2756** (0.2794)	0.0002** (0.0682)	-0.2519** (0.2595)	-0.0700** (0.0690)	-0.2423† (0.2615)
16 or more years	-0.1820** (0.0712)	-0.4114** (0.2794)	-0.1599** (0.0719)	-0.3580** (0.2821)	-0.2448** (0.0751)	-0.2326† (0.2913)
Marital Status/Health Status						
Married, wife's health limits work	0.1075** (0.0940)	0.4049** (0.2932)	0.0899** (0.0942)	0.4599** (0.2937)	-0.0174 (0.0950)	0.4133† (0.2960)
Married, wife's health doesn't limit work	-0.0396** (0.0895)	-0.1332** (0.2841)	0.0321** (0.0898)	-0.0542** (0.2848)	-0.0924 (0.0909)	0.1054† (0.2880)
Never married	-0.2017** (0.1269)	0.0816** (0.3505)	-0.2197** (0.1270)	0.0923** (0.3509)	-0.0982 (0.1328)	-0.0408† (0.3722)
Widowed	ref.	ref.	ref.	ref.	ref.	ref.
Divorced/Separated	0.0803** (0.1155)	0.1096** (0.3399)	0.0257** (0.1160)	0.0452** (0.3404)	-0.0233 (0.1163)	-0.0860† (0.3425)
Region of Residence (South is ref.)	0.0228 (0.0380)	-0.0563 (0.1105)	0.0140 (0.0381)	-0.0743 (0.1112)	-0.0887† (0.0460)	0.1376 (0.1407)
Respondent Own/Rent House/Apt						
Owned or being bought	0.0527 (0.0504)	-0.4286** (0.1285)	0.0769 (0.0508)	-0.4145** (0.1292)	0.0369 (0.0510)	-0.4030** (0.1300)
Rented	ref.	ref.	ref.	ref.	ref.	ref.
No cash rent/other	0.0671 (0.0868)	0.3425** (0.1824)	0.0843 (0.0873)	0.3229** (0.1839)	0.0773 (0.0875)	0.2218** (0.1859)
Current Residence in SMSA						
Central city of SMSA	-0.0176 (0.0455)	0.0181 (0.1315)	-0.0223 (0.0462)	-0.0173 (0.1323)	-0.1418* (0.0564)	0.2326 (0.1653)
Balance of SMSA	-0.0328 (0.0412)	0.1041 (0.1228)	-0.0211 (0.0416)	-0.1034 (0.1234)	-0.1448* (0.0530)	0.1238 (0.1580)
Not in SMSA	ref.	ref.	ref.	ref.	ref.	ref.
No. of Dependents Excluding Wife, Living in the Household	-0.0992** (0.0183)	-0.0159 (0.0393)	-0.0995** (0.0183)	-0.0183 (0.0391)	-0.0983** (0.0183)	-0.0205 (0.0387)
Annual National Unemployment Rate	0.0461** (0.0124)	0.0656† (0.0395)	0.0246† (0.0126)	0.0161 (0.0410)	0.0480** (0.0129)	0.0847* (0.0414)
Annual National Inflation Rate	0.0445** (0.0062)	-0.0528* (0.0236)	0.0347** (0.0063)	-0.0737** (0.0241)	0.0284* (0.0066)	-0.0611* (0.0252)
Characteristics of Longest Job						
Manipulative Skills of Longest Job	0.0101 (0.0255)	-0.1946* (0.0802)	0.0147 (0.0298)	-0.2919** (0.0931)	0.0196 (0.0299)	-0.2794** (0.0931)
Physical/Environmental Demands of Longest Job	-0.0050 (0.0223)	0.1293† (0.0707)	-0.0289 (0.0251)	0.0948 (0.0787)	-0.0213 (0.0253)	0.0820 (0.0786)
Substantive Complexity of Longest Job	-0.0413 (0.0288)	-0.1626† (0.0880)	0.0133 (0.0324)	-0.0624 (0.1005)	-0.0140 (0.0325)	-0.0759 (0.1007)
Social Skills of Longest Job	-0.1178** (0.0285)	0.0133 (0.0930)	-0.1127** (0.0323)	-0.0375 (0.1054)	-0.0940** (0.0323)	0.0007 (0.1037)
Class of Worker of Longest Job						
Private	0.3229** (0.0494)	-0.3602** (0.1402)	0.2884** (0.0552)	-0.3513 (0.1628)	0.2169** (0.0562)	-0.3332† (0.1646)
Government	0.5879** (0.0630)	-0.6772** (0.2198)	0.5572** (0.0712)	-0.3485 (0.2473)	0.3965** (0.0738)	-0.5153† (0.2573)
Self-employment	ref.	ref.	ref.	ref.	ref.	ref.
Tenure at Longest Job	0.0012 (0.0019)	-0.0057 (0.0056)	0.0005 (0.0021)	0.0057 (0.0065)	-0.0008 (0.0021)	0.0045 (0.0065)

Continued next page

Table 4. Nested Models of Career Effects on Retirement and Disability (Standard errors in parentheses) (*Continued*)

Variable Name	Model 1		Model 2		Model 3	
	Retirement	Disability	Retirement	Disability	Retirement	Disability
<b>Characteristics of Current Job</b>						
Manipulative Skills of Current Job			0.0114 (0.0298)	0.1843* (0.0884)	0.0089 (0.0299)	0.1487† (0.0877)
Physical/Environmental Demands of Current Job			0.0368 (0.0269)	0.0287 (0.0818)	0.0759** (0.0282)	-0.0347 (0.0843)
Substantive Complexity of Current Job			-0.0955** (0.0308)	-0.1589† (0.0959)	-0.1196** (0.0335)	-0.0174 (0.1032)
Social Skills of Current Job			0.0489 (0.0326)	0.1277 (0.1006)	0.0406 (0.0324)	0.0495 (0.0990)
<b>Class of Worker at Current Job</b>						
Private			0.0744 (0.0551)	-0.0518* (0.1657)	0.0583 (0.0564)	0.1216† (0.1692)
Government			0.0480 (0.0693)	-0.5898* (0.2315)	-0.0369 (0.0725)	-0.3124† (0.2468)
Self-employment			ref.	ref.	ref.	ref.
Tenure at Current Job			0.0039** (0.0015)	-0.0124* (0.0050)	-0.0019 (0.0019)	-0.0060 (0.0062)
<b>Employment Mobility</b>						
Number of Prior Unemployment Spells						
None			-0.5614** (0.1847)	-0.6079** (0.6309)	-0.4024** (0.1938)	-0.2188 (0.6568)
One			-0.2684** (0.1918)	0.0430** (0.6411)	-0.1498** (0.1953)	0.2415 (0.6489)
Two			-0.1726** (0.2171)	-0.3838** (0.7435)	-0.0760** (0.2188)	-0.3553 (0.7498)
Three or more			ref.	ref.	ref.	ref.
Number of Prior Labor Force Exits						
None			-0.5917** (0.0752)	-0.5268** (0.3664)	-0.4739** (0.769)	-0.0190** (0.3714)
One			-0.1497** (0.0766)	0.4219** (0.3722)	-0.1303** (0.0770)	0.5799** (0.3758)
Two or more			ref.	ref.	ref.	ref.
Health Status—"Does health limit kind/ amount of work?" 1 = yes; 0 = no					0.4134** (0.0371)	1.1904** (0.1046)
Compulsory Retirement Plan (1 = yes; 0 = no)					-0.2414** (0.0415)	-0.1933 (0.1256)
<b>Pension Coverage</b>						
Eligible for Social Security & other benefits					0.5398** (0.2058)	0.1221 (0.5465)
Eligible for Social Security only					0.4243** (0.2058)	0.3143 (0.5380)
Eligible for other benefits only					0.9321** (0.2266)	0.3825 (0.6768)
Missing					0.6853** (0.2172)	0.2974 (0.5726)
No pension coverage					ref.	ref.
Estimated Natural Logarithm of Hourly Pay					0.6529** (0.1616)	-0.7538 (0.4796)
<b>Employment Status</b>						
Working (missing/zero hours/wk)					-0.0294 (0.1270)	0.3004** (0.3054)
Full-time work (35+ hours/wk)					-0.2683** (0.1112)	-0.6031** (0.2768)
Part-time work (20-34 hours/wk)					-0.1514** (0.1207)	0.0929** (0.3011)
Part-time work (1-19 hours/wk)					0.0265** (0.1289)	0.0428** (0.3575)
Unemployed					ref.	ref.
Intercept	-199.1417	-235.6222	-200.7309	-244.7427	-208.6473	-257.6714
Log likelihood	-13024.1365	-2504.0191	-12936.3250	-2459.7697	-12810.5235	-2359.4963

Note: Significance tests refer to the association between the variable as a whole and the risk of an event.

† $p < 0.10$ ; \* $p < 0.05$ ; \*\* $p < .01$ .

quirements of manual dexterity and extensive eye-hand-foot coordination reduce the chances of deteriorating health. However, once manipulative skill requirements in the longest job are controlled, these same requirements in older workers' current occupation have the opposite effect. They increase rather than decrease the risk of disability (see Models 2 and 3), suggesting that extensive manipulative skill requirements of jobs held late in the career have a "wear and tear" effect on older workers. The results thus suggest that both a practice effect and a "wear and tear" effect are operating to influence disability, but the effects come into play depending on the stage of the career.

The results also demonstrate the importance of the structural imperatives, extrinsic rewards and risks and position in the organizational structure, for retirement and disability. Net of the measures of occupational self-direction and job pressures, mandatory retirement regulations significantly increase the chances of retirement. Pension coverage also influences retirement as does current earnings. The earnings effect is consistent with earnings' association with pension benefit levels. Although these effects, in and of themselves, are not novel, the presence of these effects in combination with the effects of the other structural imperatives illustrates the variety of ways in which the work environment affects retirement behavior.

A persistent feature of the longest occupation affecting retirement is the class of worker. Self-employment substantially lowers rates of retirement. This relationship is relatively unaffected when the class of worker of the current job is controlled. Moreover, there is no net effect of the class of worker of the current job. This pattern suggests that self-employment delays retirement not so much as a consequence of individuals' adjustments of their labor supply in accordance with their health (i.e., an effect that would be embodied in the class of worker of the current job) but as a consequence of lower lifetime pension wealth. Unlike workers who make their careers in the private and government sectors, self-employed workers bear the burden of saving for retirement.

The relative lack of retirement options for self-employed workers also is evident in their high rates of disability. In Model 1, self-employment in the longest occupation has long-term consequences for disability. However, when class of worker in the current job is controlled, this aspect of the longest occupation is no longer significant. Controlling for self-employment in the longest occupation, persons who are currently self-employed face elevated risks of disability (Model 2). This is due largely to the higher prevalence of poor health among these workers (Model 3), suggesting that self-employment may be a work destination of "last resort" for some workers. Self-employment, however, does not appear to "accommodate" the health problems of older workers.

Not shown in Table 4 are the results testing the two sets of interactions contained in the analytic model. One set of interactions allowed us to assess whether the effects of the current occupation differed depending on whether workers had ever exited the labor force (and reentered). We tested for this effect and observed that none of the estimates were statistically significant. The effects of the characteristics of the current occupation, therefore, do not differ significantly

for persons with continuous work experience compared to persons whose current occupation references a post-retirement job. A second set of interactions was considered to test for the effects of occupational mobility on retirement and disability. In no instance were any of the interactions of longest and current occupational characteristics statistically significant, denoting that occupational mobility per se does not influence retirement behavior.

Although occupational mobility per se affects neither retirement nor disability, other forms of career mobility are important explanatory factors. Most obvious are the effects of unemployment over the career and changes in labor force status. Mobile workers have the highest rates of retirement. A history of unemployment places workers at greater risk of retirement and the effect increases monotonically. As the number of unemployment episodes increases, so too does the risk of retirement. A history of movement in and out of the labor force also leaves an indelible mark. Workers who have experienced a labor force exit have a significantly higher chance of retirement relative to stable workers (see Model 3). Employment mobility (i.e., in the form of short job tenure) operates in the opposite manner on retirement. Retirement is postponed for older workers with short tenure. With the closure of retirement options comes higher rates of disability. Short tenure delays retirement primarily through inadequate pension coverage, while it leads to disability through the onset of health problems on the job.

#### CONCLUSIONS

Is the retirement process only a product of the immediate circumstances prior to retirement, or is it embedded in the broader context of the career? On balance, the results of this study support the latter view. The longest occupation held in the mid career combines with occupational roles held in the last stages of the career to influence both retirement and disability. As hypothesized, the specific structural imperatives of occupations affecting retirement and disability differ depending on the career stage. *Net of the characteristics of one's current position*, self-employment and greater social skill requirements of the longest occupation lower the chances of retirement. The longest occupation's manipulative skill requirements and substantive complexity also influence the retirement process by reducing the chances of disability. *Net of the longest occupation*, high physical demands and low levels of substantive complexity in late career occupations elevate retirement chances. So too do mandatory retirement regulations and pension benefits. And, a high level of manipulative skill requirements increases the risk of disability. The *combination* of effects demonstrates the importance of characterizing occupational positions in multidimensional terms *and* taking into account the temporal patterning of positions in order to sort out how career structures influence the retirement process.

We hypothesized that occupational self-direction and job pressures of jobs held late in the career would influence retirement to a greater extent than these same features of mid career occupations. This expectation holds for the most part. We also suggested that if such factors have a long-term effect that it would operate through the traditional de-

terminants of health status and pension characteristics. The results are consistent with this perspective. The substantive complexity of the longest occupation, for example, negatively affects disability through the eventual development of health problems on the job in occupations ranking low on this scale. As noted above, this same feature in the late career reduces the chances of retirement. In the first instance, substantive complexity (or its absence) gives rise to health problems that eventually mandate labor force withdrawal. In the second instance, substantive complexity defines the relative attractiveness of work and non-work alternatives factoring into the retirement decision. This structural imperative thus combines over the career to influence both voluntary and involuntary career endings.

The majority of the effects of the longest occupation operate through the onset of health problems. We noted the effects of physical demands and substantive complexity above. Manipulative skill requirements in the longest job have a protective effect, while these same requirements in occupations held later in the career increase the risk of disability. The key exception to this pattern is the effect of self-employment in the longest occupation. Its effect is consistent with the argument that self-employed persons are disadvantaged in terms of pension wealth, and hence access to retirement, relative to persons working the private and government sectors. At the risk of over interpreting the general pattern of results, it appears that the long-term effects of organizational position operate primarily through pension benefits, whereas the long-term effects of occupational self-direction and job pressures are felt through the onset of health problems.

The results provided no support for the idea that retirement is hinged to occupational mobility. However, the chances of retirement and disability are increased by unemployment and labor force mobility. Retirement and disability also are sensitive to employer shifts. Shifts delay the onset of retirement while increasing the risk of disability. Mobility between occupations, therefore, does not seem to carry the same consequences as movements in and out of work and between jobs. In part, this may reflect differences in what these events mean in terms of fundamental changes in the work role. Unemployment and labor force mobility, for example, both represent major discontinuities in the career and work role. Occupational mobility, at least as experienced by this sample, does not signal a similar major change in the work role. Some support for this idea is provided in Table 3 where most moves are short distance moves.

At a general level, the results highlight the fact that retirement and disability are not unique labor force behaviors contingent only on one's circumstances in the late career. Rather, these career endings are the outcomes of the trajectories of occupational incumbency and labor force mobility. Knowledge of both aspects of career structure is thus important for understanding the retirement process. The results of this study also suggest that knowledge of career structures is integral to understanding the broader spectrum of career achievement. Prior research has tended to focus only on aspects of workers' current work environment for promotion chances, occupational mobility, and wage changes. Like retirement, however, these aspects of achievement may

be sensitive to the pathways by which workers arrive in their current positions.

The broader substantive implication of these findings is that future changes in the work-to-retirement transition will be sensitive to those changes in career patterns now occurring in American society. Increasingly, researchers and policy makers are documenting significant changes in career patterns, especially the increase in employment uncertainty and the decline in job tenure, brought about by industrial restructuring, shifts in consumer demand, and technological change. These changes undoubtedly will have a ripple effect on future shifts in retirement patterns. Although the exact form of these changes is uncertain, the results shown here indicate the likelihood of growing variability in the work-to-retirement transition.

Many of the recently observed changes in career patterns, especially those brought about through economic restructuring, raise the specter of a withering away of traditional contracts, both implied and explicit, linking workers and employers. How, or if, these contracts are being rewritten is not yet clear. Simultaneously, the sanctity of Social Security contract between workers and the state is in doubt. The age eligibility criteria already have been changed for future cohorts, and a significant number of younger Americans lack confidence in the longer term viability of the Social Security system.

It is tempting to surmise that retirement is becoming "de-institutionalized." However, this may not be the case. As yet, though the character of the traditional social contracts may be changing, none of the key institutional actors appears to have abandoned retirement as a reward for a lifetime of work commitment or a means of social control. Instead, the diversity of the work-to-retirement transition may represent a broadening of the institution of retirement. Increasingly, the institution is reflective of the assortment of pathways forged and contested by the key institutional actors, the state, employers, and workers themselves.

#### ACKNOWLEDGMENTS

This research was supported partially by Grant AG09338 from the National Institute on Aging. Institutional support was provided by Pennsylvania State University's NICHD Population Research Center Grant 5 P30 HD28263. We would like to thank Margaret Krecker, David Hachen, Amy Pienta, three anonymous reviewers, and the editor for their insightful comments.

Address correspondence to Mark D. Hayward, Population Research Institute, Penn State University, 501 Oswald Tower, University Park, PA 16802-6210. E-mail: hayward@pop.psu.edu

#### REFERENCES

- Behrman, J. R., Sickles, R. C., & Taubman, P. (1990). Age-specific death rates with tobacco smoking and occupational activity: Sensitivity to sample length, functional form, and unobserved frailty. *Demography*, 27, 267-284.
- Blau, P. M., & Duncan, O. D. (1967). *The American occupational structure*. New York: Free Press.
- Diamond, P. A., & Hausman, J. A. (1984). The retirement and unemployment behavior of older men. In H. J. Aaron & G. Burtless (Eds.), *Retirement and economic behavior* (pp. 97-134). Washington, DC: Brookings Institution.
- DiPrete, T. A., & Krecker, M. L. (1991). Occupational linkages and job mobility within and across organizations. *Research in Social Stratification and Mobility*, 10, 91-131.

- Ekerdt, D. J., & DeViney, S. (1990). On defining persons as retired. *Journal of Aging Studies*, 4, 211-229.
- Elder, G. H., Jr., & Pavalko, E. K. (1993). Work careers in men's later years: Transitions, trajectories, and historical change. *Journal of Gerontology: Social Sciences*, 48, S180-S191.
- Hachen, D. S. (1992). Industrial characteristics and job mobility rates. *American Sociological Review*, 57, 39-55.
- Hayward, M. D., Crimmins, E. M., & Wray, L. (1994). The relationship between retirement life cycle changes and older men's labor force participation rates. *Journal of Gerontology: Social Sciences*, 49, S219-S230.
- Hayward, M. D., & Grady, W. R. (1986). The occupational retention and recruitment of older men: The influence of structural characteristics of work. *Social Forces*, 64, 1032-1045.
- Hayward, M. D., Grady, W. R., Hardy, M. A., & Sommers, D. (1989). Occupational influences on retirement, disability, and death. *Demography*, 26, 393-409.
- Hayward, M. D., Grady, W. R., & McLaughlin, S. D. (1988a). Changes in the retirement process among older men in the United States: 1972-1980. *Demography*, 25, 371-386.
- Hayward, M. D., Grady, W. R., & McLaughlin, S. D. (1988b). The retirement process among women in the United States: Changes in the 1970s. *Research on Aging*, 10, 358-382.
- Hayward, M. D., Hardy, M. A., & Liu, M. (1994). Work after retirement among older men in the United States. *Social Science Research*, 23, 82-107.
- Henretta, J. C., O'Rand, A. M., & Chan, C. C. (1993). Joint role investments and synchronization of retirement: A sequential approach to couples' retirement timing. *Social Forces*, 71, 981-1000.
- Johnson, J. V., Hall, E. M., & Theorell, T. (1989). Combined effects of job strain and social isolation on cardiovascular disease morbidity and mortality in a random sample of the Swedish male working population. *Scandinavian Journal of Work, Environment, & Health*, 15, 271-279.
- Karasek, R. (1990). Lower health risk with increased job control among white-collar workers. *Journal of Organizational Behavior*, 11, 171-185.
- Karasek, R., Gardell, B., & Lindell, J. (1987). Work and non-work correlates of illness and behavior in male and female Swedish white-collar workers. *Journal of Occupational Behavior*, 8, 187-207.
- Karasek, R. A., Theorell, T., & Schwartz, J. E. (1988). Job characteristics in relation to the prevalence of myocardial infarction in the US Health Examination Survey (HES) and the Health and Nutrition Examination Survey (HANES). *American Journal of Public Health*, 78, 910-918.
- Kohn, M. L., Schooler, C. (with the collaboration of J. Miller, K. A. Miller, C. Schoenbach, & R. Schoenberg). (1983). *Work and personality: An inquiry into the impact of social stratification*. Norwood, MA: Ablex.
- Mare, R. D. (1990). Socioeconomic careers and differential mortality among older men in the United States. In J. Vallin, S. D'Souza, & A. Palloni (Eds.), *Measurement and analysis of mortality: New approaches* (pp. 362-387). Oxford, England: Clarendon Press.
- Moore, D. E., & Hayward, M. D. (1990). Occupational careers and mortality among older men. *Demography*, 27, 31-53.
- Mutran, E., & Reitzes, D. C. (1989). Labor force participation and health: A cohort comparison of older male workers. *Social Science Quarterly*, 70, 449-467.
- O'Rand, A. M. (1986). The hidden payroll: Employee benefits and the structure of workplace inequality. *Sociological Forum*, 1, 657-683.
- O'Rand, A. M., & MacLean, V. M. (1986). Labor market, pension rule structure, and retirement benefit promise for long-term employees. *Social Forces*, 65, 217-240.
- Östlin, P. (1988). Negative health selection into physically light occupations. *Journal of Epidemiology and Community Health*, 42, 152-156.
- Palmore, E. B., Burchett, B. M., Fillenbaum, G., George, L. K., & Wallman, L. M. (1985). *Retirement: Causes and consequences*. Durham, NC: Duke University Press.
- Parnes, H. S., & Less, L. J. (1985). The volume and pattern of retirements, 1966-1981. In H. S. Parnes, J. E. Crowley, R. J. Haurin, L. J. Less, W. R. Morgan, F. L. Mott, & G. Nestel (Eds.), *Retirement among American men* (pp. 57-77). Lexington, MA: DC Heath.
- Quinn, J. F., Burkhauser, R. V., & Myers, D. A. (1990). *Passing the torch: The influence of economic incentives on work and retirement*. Kalamazoo, MI: W. E. Upjohn Institute for Employment Research.
- Ruhm, C. J. (1991). Career employment and job stopping. *Industrial Relations*, 30, 193-208.
- Siegel, J. S. (1993). *A generation of change: A profile of America's older population*. New York: Russell Sage Foundation.
- Spencer, K. I. (1988a). Occupations, work settings, and the course of adult development: Tracing the implications of select historical changes. In P. B. Baltes, D. L. Featherman, & R. M. Lerner (Eds.), *Life-span development and behavior* (pp. 243-285). Hillsdale, NJ: Erlbaum.
- Spencer, K. I. (1988b). Social stratification, work, and personality. *Annual Review of Sociology*, 14, 69-97.
- Spilerman, S. (1977). Careers, labor market structure, and socioeconomic achievement. *American Journal of Sociology*, 83, 551-593.
- Tolbert, C. M., II. (1982). Industrial segmentation and men's career mobility. *American Sociological Review*, 47, 457-477.
- Tuma, N. B., & Sandefur, G. D. (1988). Trends in the labor force activity of the elderly in the United States, 1940-1980. In R. Ricardo-Campbell & E. P. Lazear (Eds.), *Issues in contemporary retirement* (pp. 38-83). Stanford, CA: Hoover Institute Press.

Received November 6, 1996

Accepted August 27, 1997