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JOB CHARACTERISTICS AND EARLY RETIREMENT

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ABSTRACT

A sample of white married men around early retirement age from the Social Administration's Retirement History Study and specific job characteristics derived from the Labor Department's Dictionary of Occupation Titles are combined to study the influence of the work environment on retirement status. The analysis suggests that individuals are more likely to withdraw from jobs with undesirable attributes, and that these relationships are affected by an individual's health status and current Social Security and pension eligibility. In particular, respondents with a health limitation are more sensitive to the job environment than those in good health. In addition, there is some evidence that individuals currently eligible for retirement income are more responsive to the characteristics of the workplace than those who are not.

Job Characteristics and Early Retirement

1. INTRODUCTION

There has been a noticeable increase recently in the research effort devoted to retirement issues. This has been prompted by dramatic changes in the incidence of early retirement over the postwar period, the increased awareness of funding problems within the Social Security system, and the availability of two excellent microeconomic data sources on individuals approaching retirement age--The Labor Department's National Longitudinal Survey of Mature Men and the Social Security Administration's Retirement History Study. Two basic methodological approaches have been used to analyze the determinants of the retirement decision. In the first, a very subjective approach, retired individuals are simply asked why they retired, or left their last job. The most frequent response is always that health was the primary motivating factor.[1] The implication is either that poor health had made continued employment impossible or undersirable, or that the respondents expected their health to improve after retirement. Depending on the questionnaire format used, other frequent responses include "wanted to retire," "job," and "pressure to leave work." Very few individuals mention the availability of retirement income sources. Though informative, this subjective approach has been criticized by those who suggest that the responses are probably motivated by a number of conscious and subconscious factors, in addition to the real reasons for retirement.[2] The respondent, for example, may be interested in providing a socially acceptable retirement motive, and so may unintentionally color health or situational factors in the

workplace to this end. The second methodological approach avoids these subjective responses, and relies instead on econometric analysis of labor force (or retirement) status. In these studies, although health is usually still important, the availability of retirement income sources (Social Security and pensions) emerges as a key factor (see Boskin 1977; Quinn 1977). Although these studies have the advantage of increased objectivity, they tend to ignore some of the dimensions alluded to in the subjective answers mentioned above. In particular, the influence of the work environment has not been adequately treated. These environmental factors--the focus of this study--include the nature of the job and the actual working conditions under which the tasks are performed. This would certainly appear to be an important dimension to the casual empiricist, and may be behind many of the job related answers offered by respondents to subjective questionnaires.

The literature in this area is extremely limited because researchers rarely have a description of the job environment other than that provided by the respondent himself. An exception to this is the work of Jacobson (1972), who studied the retirement intentions and attitudes of 145 semi-skilled British operatives aged 55-64 and related these attitudes and intentions to the amount of strain on the job. Job strain was objectively described by a "Rest Allowance" index, which is defined as "the percentage of the work cycle allocated to compensation for fatigue incurred during the cycle" (p. 66). Workers were divided into three categories, according to the amount of strain on their jobs, and Jacobson found that those in the "heavy strain" category were more than twice as likely to be willing to retire at a pensionable age, to prefer to retire before age 65, and

to view retirement before age 65 as ideal. He also found that the percentage of workers with a retirement orientation increased with the degree of rigidity fixed in the work pattern. Conversely, those with some autonomy on the job were much more likely to prefer working beyond the retirement age.

This study expands on Jacobson's research in a number of ways; most importantly, it investigates actual retirement (labor force) patterns rather than retirement intentions. Although intentions are interesting, they may change in systematic ways as people approach retirement age. If this is true, then actual behavior is the more important dimension from a policy perspective, although the nature of and reasons for the systematic change are also of interest. We also have a much larger and more representative sample than did Jacobson, and one which includes both retired and working respondents. Finally, we investigate a wider range of objectively defined working conditions, and control for the individual's health, and Social Security and pension eligibility status.

We hypothesize that individuals near the end of their working careers will be less likely to be retired the more favorable the environment in which they work. Both the nature of the job and physical working conditions are included in the environment. We suspect that, ceteris paribus, individuals will be more likely to remain at jobs that are interesting and provide variety than those that are monotonous and repetitive. Another hypothesis is that individuals nearing retirement age will be more likely to withdraw from jobs that are physically demanding or involve unpleasant working conditions. These hypotheses are all consistent with Jacobson's work on preretirement intentions.

This is not to suggest that job characteristics are the only, or even the most important, retirement determinants. Common sense and previous research indicate that these factors should be analyzed within a medical and economic framework. Certain health limitations make continued work either impossible or very difficult. Lack of adequate retirement income also considerably limits retirement options. We suggest that job characteristics affect worker preferences within this medical and economic framework. Operationally, it is necessary to control for health differences, and for the availability of retirement income. This is done by stratifying by health condition and eligibility status for Social Security and other pension income, thereby allowing complete interaction between these dimensions and the job characteristics under study.[3]

2. DATA AND SAMPLE

This research utilizes two data sources. The first is the 1969 wave of the Retirement History Study (RHS)--a 10-year longitudinal study of the retirement process being conducted by the Social Security Administration.[4] The initial 1969 cross-section contains over 11,000 respondents--men and nonmarried women aged 58-63. In order to obtain a more homogeneous group for analysis, this study concentrates on the largest subset--white married men. Farmers and the self-employed, those seriously ill (operationally, the bedridden and the housebound), and a few small miscellaneous groups have been eliminated from this analysis, leaving a sample of 4,845. For each of these men, we know the Census 3-digit occupational and industrial

categories for their current job, or, if not currently employed, for their last job. These Census codes provide the link to the specific job characteristics--the focus of this research.

The Bureau of Employment Security of the Department of Labor (1965) has developed extensive job descriptions for each of the nearly 14,000 jobs found in the Dictionary of Occupational Titles (DOT). These descriptions, which appear as a series of dummy variables, are not widely used in social science research because so few other data sources utilize the detailed DOT categorization scheme. Fortunately, a cross-classification matrix has been developed which lists, for each of the Census occupational categories, the probability of holding each of the 14,000 DOT occupations. With this, and the DOT descriptions, we can calculate expected job characteristics, or the probability that a worker in a given Census occupation will have a particular characteristic.[5] These probabilities are then divided into "high" and "low" categories with 0.50 as the dividing line.

Seven job dimensions are included in this analysis. The first three are rough attempts to describe the general nature of the job; in particular, whether it involves the performance of an entire activity or the performance of a number of repetitious, short cycle operations. The last four dimensions describe the physical demands of the job, and the working conditions under which the tasks are performed. The characteristics are described in more detail below.

1. Whole Activity: involving the direction, planning and control of an entire activity or the activities of others
2. Repetitive: involving repetitive or short cycle operations carried out according to set procedures and sequences

3. Specific Instructions: involving doing things under specific instructions, with little or no room for independent action or judgment in working out problems
4. Stress: involving taking risks or performing adequately under stress when confronted with the critical or unexpected
5. Strength: involving heavy work, or very heavy work
6. Physical: involving other physical activities, such as climbing, balancing, stooping, kneeling, crouching, crawling, handling or reaching
7. Bad Working Conditions: involving extreme heat or cold, wet or humid conditions, noise or vibrations, hazards, fumes, odors, toxic conditions, dust or poor ventilation

[U.S. Bureau of Employment Security, 1965, pp. 131, 145-151]

We hypothesize that the first of these is a favorable job attribute, and that individuals with jobs involving the performance of an entire activity are more likely to have interesting work, and therefore less likely, ceteris paribus, to have retired. The other attributes are judged to be unfavorable, and should be associated with increased labor force withdrawal.

3. EMPIRICAL RESULTS

The RHS sample on which this study is based includes 4,845 white married men, aged 58-63, of whom 636 (13.1%) have retired from the labor force, and 4,209 (86.9%) have not.[6] (Sample sizes of the subsets and mean values for the job characteristics are shown in the Appendix.)

Using Chi-squared techniques, we test whether there are significantly different proportions of those who are retired when we disaggregate along each of the job attribute dimensions.

Table 1 presents the percentage retired for high and low levels of each job attribute, without the use of any control variables. At this aggregate level, there is considerable support for our hypotheses. Workers involved in a whole activity are less likely to have retired than those not so involved, and individuals whose jobs involve repetitive work, work under specific instructions, stress, strength, other physical demands or bad working conditions are more likely to have retired. All of the differences are highly significant, and five of them exceed the .001 level.

Table 1 may overstate the influence of job attributes on the retirement decision, since the existence of these attributes may be correlated with other important factors. The most obvious is health status. As is shown in Table 2, unfavorable job attributes are associated with relatively poor health. People whose jobs involve the direction, planning or control of an entire activity are less likely to suffer a health limitation than those whose jobs do not, and individuals whose jobs involve repetitive tasks, work under specific instructions, stress, strength, other physical demands or undesirable working conditions are more likely to have a health limitation. It may be the effects of the health dimension rather than the direct influence of job characteristics that are important. If this is the case, the differences will disappear when we disaggregate by health status; operationally, by whether the individual has a health condition limiting the amount or kind of work he can do. Job attributes are also

Table 1

Retirement Status
(percentage out of the labor force)
by Job Characteristics

Job Characteristic	Probability of Having Characteristic: Low (0-50%)	High (51-100%)	Chi Squared Probability Level[a]
Whole activity	14.2%	10.0%	.000
Repetitive	11.2	18.4	.000
Specific instructions	12.2	17.8	.000
Stress	12.9	21.0	.015
Strength	12.9	16.8	.053
Physical	11.9	15.5	.000
Bad working conditions	11.4	15.0	.000

[a]The probability that there is no relationship between job characteristics and labor force status.

Table 2

Health Status
(percentage with a health limitation)
by Job Characteristics

Job Characteristic	Probability of Having Characteristic: Low (0-50%)	High (51-100%)	Probability Level[a]
Whole activity	31.6%	20.5%	.000
Repetitive	25.9	36.8	.000
Specific instructions	27.5	35.3	.000
Stress	28.5	39.5	.012
Strength	28.5	32.3	.162
Physical	26.4	33.2	.000
Bad working conditions	25.2	32.8	.000

[a]See Table 1.

correlated with pension eligibility status, since both vary by industry and occupation. With one exception (stress), individuals in the less favorable half of the probability distribution for each characteristic (low probability of whole activity and high probabilities of all of the other attributes) are significantly less likely to be currently eligible for a pension. Again, the relationships in Table 1 may be picking up this pension effect. Finally, there is a much weaker relationship between these job characteristics and current Social Security eligibility. This correlation is relatively weak because of the extensive coverage of the Social Security system. With few exceptions, those 62 and over are eligible for Social Security, while those under 62 are not.

In Table 3, we disaggregate by health status and some interesting patterns emerge.[7] Obviously, the percentage of those with some health limitation who are out of the labor force (33%) exceeds the percentage of those with no limitation (5%). Among the former, the influence of the job characteristics is exactly as expected--people with unfavorable job attributes are more likely to have retired. In general, the differences are very significant. The one exception to the high significance level (stress) is probably explained by the fact that less than 3% of this sample have (or had) jobs with stress probabilities over 50%. (See the Appendix.) When we disaggregate by health, there are very few respondents in each group with stressful jobs, making a highly significant pattern unlikely.

Among individuals with no health limitation, the results are quite different. For four of the attributes, there are no significant differences in the retirement patterns of those with and without the characteristic.

Table 3

Retirement Status
(percentage out of the labor force)
by Job Characteristics,
Controlling for Health Status

Job Characteristic	Health Limitation	Probability of Having Characteristic: Low (0-50%)	High (51-100%)	Probability Level[a]
Whole activity	no	4.5%	6.1%	.061
	yes	35.1	25.3	.003
Repetitive	no	5.1	4.6	---
	yes	28.8	42.2	.000
Specific instructions	no	5.0	4.8	---
	yes	31.1	41.6	.000
Stress	no	4.9	5.6	---
	yes	32.9	44.7	.128
Strength	no	5.0	5.0	---
	yes	32.7	41.5	.080
Physical	no	5.4	4.0	.079
	yes	29.7	38.7	.001
Bad working conditions	no	5.7	4.0	.022
	yes	28.4	37.6	.000

Note: (---) denotes probability level above .15.

[a]See Table 1.

For the other three (whole activity, physical demands, and bad working conditions), there are significant differences, but in an unexpected direction. Among the healthy, people are more likely to be retired from a job involving a whole activity, and less likely from jobs requiring physical exertion or bad working conditions. There are several conceivable explanations for these results. First, it is a subjective judgment on our part that these attributes are favorable or unfavorable. It may be, for example, that some individuals, even in this age cohort, enjoy a physically demanding job, or hot or cold conditions. And it is certainly more likely that someone who is in good health would feel this way than someone who is not. Secondly, both the "physical" and "bad working conditions" categories encompass a number of dimensions. For example, "physical" includes climbing, crouching and crawling as well as reaching or handling. "Bad working conditions" include both heat and cold, and fumes, toxic conditions, dust and poor ventilation. The data do not reveal which of these component dimensions apply. Since the job environment undoubtedly affects an individual's health, it may be that those with poor health are more likely to have jobs with the more severe components. To exaggerate this hypothesis, it might be true that, for those with health limitations, "physical" usually means crouching and crawling, and "bad working conditions" denote hazards, fumes, toxic conditions and poor ventilation, while for those in good health, "physical" represents only handling and reaching, and "bad working conditions" merely implies working in the heat. If this scenario is accurate, then it is reasonable to expect that physical demands and bad working conditions would have a larger effect, in the expected direction, on those in relatively poor health, which is exactly what is found.

Finally, the unexpected results may be reflecting the effects of excluded variables; in particular, retirement income eligibility status. Since individuals in jobs with unfavorable characteristics are less likely to have current pension eligibility, they will be less able to retire. We control for these retirement income differences below.

In Table 4, the sample is disaggregated into eight groups on the basis of health status, current Social Security eligibility and current pension eligibility.[8] Despite more severe problems with sample size, the same patterns observed in Table 3 emerge.[9] The effect of job characteristics on retirement status falls primarily on those with health limitations. In the four cells with health limitations, and the six job attributes shown in Table 4, 23 of the 24 percentage comparisons show differences in the expected direction;[10] of these, twelve of the differences are significant at the 0.15 level, and eight at the .10 level. Despite the insignificance of half of the differences, the fact that all but one are in the expected direction, and the significance of the others, provides strong support for the hypothesis that job attributes do influence the retirement decisions of those in relatively poor health.

There is also some evidence that the influence of the job environment may depend on Social Security eligibility. In the last two subgroups (those with a health limitation and eligible for Social Security), nine of the twelve differences are significant at the 0.15 level, and seven at the 0.10 level. In the two previous groups (those with health limitations but ineligible for Social Security), only three of twelve differences are significant at the 0.15 level, and only one at 0.10. In the last group (with a health limitation, and eligible for both Social Security and a

Table 4

Retirement Status
(percentage out of the labor force)
by Job Characteristics,
Controlling for Health Status,
Current Social Security Fligibility,
and Current Pension Fligibility

Job Characteristic	Health Limitation	Elig. for SS	Elig. for Pension	Probability of Having Characteristic Low (0-50%)	High (51-100%)	Probability Level[a]
Whole activity	no	no	no	0.9%	2.0%	.111
	no	no	yes	5.6	7.1	---
	no	yes	no	5.7	3.3	---
	no	yes	yes	20.8	22.5	---
	yes	no	no	12.6	7.4	---
	yes	no	yes	27.8	23.2	---
	yes	yes	no	55.7	47.1	---
	yes	yes	yes	65.9	50.0	.098
Repetitive	no	no	no	1.2	1.3	---
	no	no	yes	6.1	6.3	---
	no	yes	no	5.7	3.3	---
	no	yes	yes	21.1	22.6	---
	yes	no	no	10.1	15.0	.106
	yes	no	yes	23.7	33.3	---
	yes	yes	no	49.8	61.8	.026
	yes	yes	yes	45.6	78.7	.001
Specific instructions	no	no	no	1.2	1.2	---
	no	no	yes	5.4	10.3	.125
	no	yes	no	5.4	3.8	---
	no	yes	yes	21.2	22.7	---
	yes	no	no	9.3	21.0	.001
	yes	no	yes	24.4	36.4	---
	yes	yes	no	53.5	57.3	---
	yes	yes	yes	60.7	75.8	.146
Stress				Never significant		
Strength	no	no	no	1.3	0.0	---
	no	no	yes	5.8	11.8	---
	no	yes	no	4.5	14.3	.034
	no	yes	yes	21.8	11.8	---
	yes	no	no	11.2	17.8	---
	yes	no	yes	25.1	38.9	---
	yes	yes	no	53.1	72.4	.069
	yes	yes	yes	63.5	57.1	---

Table 4--Continued.

Job Characteristic	Health Limitation	Elig. for SS	Elig. for Pension	Probability of Having Characteristic Low (0-50%)	High (51-100%)	Probability Level[a]
Physical	no	no	no	1.5	0.6	.118
	no	no	yes	6.4	5.5	---
	no	yes	no	3.5	8.2	.027
	no	yes	yes	23.3	16.0	---
	yes	no	no	9.9	14.4	.114
	yes	no	yes	25.2	29.6	---
	yes	yes	no	50.7	58.9	.132
	yes	yes	yes	57.5	71.4	.056
Bad working conditions	no	no	no	1.7	0.7	.055
	no	no	yes	6.0	6.3	---
	no	yes	no	4.2	6.3	---
	no	yes	yes	23.1	18.2	---
	yes	no	no	10.2	13.0	---
	yes	no	yes	25.9	27.3	---
	yes	yes	no	48.3	58.5	.065
	yes	yes	yes	53.1	71.7	.008

[a]See Table 1.

pension), five of six differences are significant at the 0.15 level, despite a sample size of only 211. This supports our premise that the effects of job characteristics should be studied within an economic framework. It appears that the effects are strongest among those with the most economic discretion, that is, among those eligible for retirement income sources.

As before, the evidence is not strong among those without a health limitation. Only 11 of the 24 comparisons yield differences in the expected direction, and only 2 of these are significant at the .10 level. There is only one cell with a significant difference (at the .10 level) in the wrong direction, indicating that some of the unexpected results in Table 3 may have been due to correlations between job characteristics and retirement income eligibility.

4. CONCLUSIONS

Using a large sample of white married men around early retirement age, and objective job characteristics derived from the Department of Labor occupational descriptions, we present statistical support for the hypothesis that individuals are more likely to retire from jobs with undesirable job attributes. The relationship, however, is more complicated than has been acknowledged before. In particular, there is an important interaction with health status. Those respondents who have a health condition limiting the kind or amount of work they can do are much more sensitive to the job environment than those in good health. This may be because the health limitation increases the importance (the disutility) of any given undesirable job attribute, or because, on average, the bad

job characteristics of those in poor health are more severe than the bad job characteristics of those with no health limitation. There is also evidence that the effect of job attributes depends on the individual's retirement income status. Because those currently eligible for Social Security or pension benefits have more options available than those who are not eligible they are therefore more able to respond to and withdraw from an undesirable workplace.

We do not propose that the environmental dimensions we have studied are the primary determinants of retirement status. In fact, we hypothesize just the opposite: that health and retirement income eligibility are more important, and that the effects of job characteristics must be analyzed within this medical and economic framework. When we control for these other factors, however, we do find that the nature of the job and the conditions under which the work is performed do influence the early retirement decision, especially among those with health limitations.

APPENDIX

Sample Sizes and Distribution of Job Characteristics

I. SAMPLE SIZES			SAMPLE SIZE (N)	PERCENT OUT OF THE LABOR FORCE
Total Sample			4845 (100%)	13.1%
Health Subsets				
Without a health limitation			3450 (71.2%)	5.0%
With a health limitation			1395 (28.8%)	33.3%
Health, Social Security and Pension Subsets				
Health Limitation	Elig. for SS	Elig. for Pension		
no	no	no	1917 (39.6%)	1.2%
no	no	yes	604 (12.5%)	6.1%
no	yes	no	541 (11.2%)	5.2%
no	yes	yes	388 (8.0%)	21.4%
yes	no	no	608 (12.5%)	11.7%
yes	no	yes	189 (3.9%)	26.5%
yes	yes	no	387 (8.0%)	54.5%
yes	yes	yes	211 (4.4%)	63.0%

II. DISTRIBUTION OF JOB CHARACTERISTICS

Job Characteristic	Probability of Having Characteristic Low (0-50%)	High (51-100%)
Whole activity	3609 (74.5%)	1236 (25.5%)
Repetitive	3558 (73.4%)	1287 (26.6%)
Specific instructions	4014 (82.8%)	831 (17.2%)
Stress	4726 (97.5%)	119 (2.5%)
Strength	4517 (93.2%)	328 (6.8%)
Physical	3154 (65.1%)	1691 (34.9%)
Bad working conditions	2561 (52.9%)	2284 (47.1%)

NOTES

[1]In a national survey in the 1960s, Barfield and Morgan (1974, p. 218) report that 42% of the retirees sampled named health as the primary reason for retirement. In a survey of new social security beneficiaries under 65, Reno (1971, p. 32) reports that 45% labelled health the most important reason for leaving their last job. Finally, in the data source used for this study, 66% of the retired men claimed health as their primary retirement motive.

[2]For some empirical evidence on this issue, see Quinn (1977, p. 331).

[3]In a study of the retirement decision which did not concentrate on the job environment, these three factors were found to be the most important determinants (see Quinn, 1977).

[4]For a detailed description of this data source, see Irelan (1973).

[5]The probability that Census occupation K has job characteristic J is calculated as follows.

$$\text{Prob}(J|K) = \Sigma_i [\text{Prob}(J|\text{DOT}_i) \cdot \text{Prob}(\text{DOT}_i|K)]$$

where i ranges over all DOT jobs. The terms "$\text{Prob}(J|\text{DOT}_i)$" will be either 0 or 1, since each DOT job either has the characteristic or does not. The "$\text{Prob}(\text{DOT}_i|K)$" terms are derived from the cross-classification matrix, and will sum to 1, with the vast majority being 0. The result of these calculations, for each Census occupation, is a series of probabilities between 0 and 1, one for each job characteristic. These probabilities are then assigned to the individuals in the sample on the basis of their occupational codes. For those currently employed, the job characteristics refer to their current jobs; for those retired, they refer to the last job.

For example, if 75% of the jobs in Census occupation 1 were in DOT category 10 and the remainder were in DOT 11, and DOT job 10 had characteristic J while DOT 11 did not, the probability of finding attribute J in Census occupation 1 would be

$$\text{Prob}\,(J \mid \text{Census job 1}) = 0 + 0 + , \ldots + (.75)1 + (.25)0 + 0 + 0 + \ldots 0 = .75.$$

[6]Early retirement is defined here as complete labor force withdrawal prior to age 65.

[7]In this sample, 28.8% reported a health condition which limited the type or amount of work they can do, and 71.2% did not. The seriously ill--the bedridden and housebound--have already been removed from the sample.

[8]These dimensions denote <u>current</u> eligibility status, not merely coverage by a program. In other words, an individual "currently eligible" could receive benefits immediately if he were to retire.

[9]For example, the group with a health limitation, eligible for a pension, but ineligible for Social Security contains only 189 individuals. Although every one of the percentage comparisons is in the expected direction--those with unfavorable characteristics are more likely to have retired--none of the differences is statistically significant.

[10]Because of the extremely small numbers of individuals with stressful jobs in the subsamples, none of these differences was significant. It is worth noting that the concept of stress used here (taking risks, or confronting the unexpected) is very different from the stress concept used by Jacobson, who defined it in terms of the percentage of the work cycle allocated to rest.

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