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# LABOR TURNOVER AND YOUTH UNEMPLOYMENT

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## ABSTRACT

The main question of concern in this paper is why youth unemployment is high relative to unemployment of adults. The analysis is based largely on longitudinal micro-data in the NLS and MID panels of men, surveyed in the 1966-1976 decade.

Since the duration of unemployment increases with age, incidence that is the probability of experiencing unemployment is the main focus of our analysis. The basic finding is that the at first rapid and then decelerating decline with age in the probability of unemployment stems from a similarly shaped relation between the probability of separation (from a job) and working age. The age patterns are, in turn, mainly due to the decline of probabilities as tenure lengthens. Indeed, at given levels of tenure, unemployment incidence does not at all decline with age, except among blacks and in periods of high unemployment. We conclude that the short tenure level of the young is the main reason for the age differential in unemployment. To check this we compare youth with short-tenured groups which are not adversely selected, migrants who were not unemployed before migration and immigrants. The comparison reveals that youth are in the same situation as others with little accumulated tenure. We do note, however, that unemployment declines more slowly for youth than for others, reflecting the gradually increasing commitment to work in the transition from school to work and from parental to own household.

Increases in the duration of unemployment with age are ascribed, within a search model framework, to a decline in the probability of finding job vacancies among older movers. The inference of increasing difficulty in job finding is also consistent with observed increases in the probability of unemployment conditional on separation, declines in the quit/layoff ration, and in wage gains from moves as workers age.

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# Labor Turnover and Youth Unemployment

by

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## 1. Introduction: The Youth Unemployment Problem

Public concern about youth employment problems in the U.S. derives from three facts: (1) the unemployment rate of young people is high in absolute numbers, in relation to adult unemployment, and in comparison with other countries, (2) unemployment rates of black youth are much higher and a large fraction of non-working black youth does not even search for jobs, (3) youth unemployment rates have increased in recent years. The trend is not pronounced among whites, but the rate for black youth has risen from levels comparable to white rates in the 1950's to the present depression-like levels.

In this paper we do not address the problem of trends. It is an important question for assessing the plight of black youth and a smaller one for the white population beyond the adverse, but temporary conjunction of the

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business and demographic cycles. Rather, our question refers to the more permanent fact of high youth unemployment. Why is it so high? Are there criteria by which we can judge that it is too high? Why does it decline with age in a particular fashion?

Recent developments in the economics of labor markets provide two complementary approaches to the understanding of differential unemployment. Search models are applicable, in principle, to the analysis of duration of unemployment, as they highlight the conditions under which job search terminates. On the other hand, episodes of unemployment originate in the context of job or inter-labor force moves, so that models of labor turnover are most useful in understanding the incidence of unemployment. Since age differences in the incidence of unemployment are even larger than differences in unemployment rates, we emphasize labor turnover as the main framework for analyzing the relation between age and unemployment. We also employ a search model which captures some relevant aspects of the age differentials in job separation and in the duration of unemployment.

Our data sets are the panels of men in the National Longitudinal Surveys (NLS) and in the Michigan Income Dynamics surveys (MID). The data lend themselves to several analyses with which we attempt to illuminate the structure of unemployment. In section II we decompose the "unemployment rate" observed in a period into incidence, or proportion of persons experiencing unemployment

some time during the period, and average duration of unemployment during the period. This enables us to assess the relative importance of each component in creating unemployment differentials among age or any other population subgroups.

We observe the incidence and duration of unemployment in periods longer than a year in section III. The rate at which incidence and duration increase as the period is lengthened indicates the degree of persistence of unemployment or its converse,the degree of turnover among the unemployed. The observed degree of persistence may be due to positive serial correlation in the probability of experiencing unemployment for given individuals, or to heterogeneity in this probability across individuals, or both. These categories cannot be distinguished by lengthening the period, but are explored in regression analyses (section V).

In section IV we relate current unemployment incidence P(u) to current labor mobility, defined as the probability of job separation from the current employer P(s). We compare P(u) and P(s) over the life-cycle and by length of job tenure. The apparent absence of "aging effects" on the incidence of unemployment is tested in comparisons of youths with migrants. According to the identity $P(u) = P(s) \cdot P(u|s)$, factors underlying labor mobility P(s) ought to account for some of the patterns of incidence P(u), expecially when recall unemployment is excluded from P(u). We explore the factors underlying the probabilities P(s) and P(u) in regression analyses in section V.

Further insights into differences in conditional unemployment P(u s) and in duration of unemployment are obtained in a search model presented in section VI. This model also carries implication for quit/layoff behavior and for wage changes connected with separations and unemployment.

Section VII is a replication of regression analyses on data for blacks and an analysis of the racial differentials.

## II. Components of Unemployment

The same rate of unemployment is observed during a survey week when a certain proportion of the labor force is unemployed two months on average or when only one third of that proportion is unemployed for a period of six months. The rate does not tell us whether a large number of those affected share a small burden or whether the opposite is the case. If the observation period is sufficiently long, the rate can be decomposed into incidence and duration of unemployment. Whether or not time spent in unemployment is to be interpreted as distress or as productive activity, we want to know whether it is incidence or duration which is mainly responsible for the differences in particular comparisons of population groups.

To do this we may define a personal unemployment rate during the period (e.g. a year) by the ratio of weeks spent in unemployment to weeks spent in the labor force:

$$(1) \qquad u_i = \frac{W_{ui}}{W_{Li}}$$

A simple average of $u_i$ would measure the group unemployment rate in an average week if each person spent the same number of weeks per year in the labor force. Otherwise the individual $u_i$ must be weighted by their time in the labor force $W_{Li}$ in averaging. As a result the group rate is obtained in:

$$(2) \qquad \bar{u} = \frac{\sum_i W_{Li}\left(\frac{W_{ui}}{W_{Li}}\right)}{\sum_i W_{Li}} = \frac{\sum_i W_{ui}}{\sum_i W_{Li}} = \frac{N}{L} \cdot \frac{\bar{W}_u}{\bar{W}_L} = \frac{N}{L} \cdot \bar{W}_u \cdot \frac{1}{1-\bar{W}_o}$$

where N is the number of persons unemployed some time during the period, L the number of people in the labor force some time during the period. $\frac{N}{L}$ is the incidence of unemployment during the period. $\bar{W}_u$ is the average fraction of the period spent in unemployment by the unemployed, $\bar{W}_L$ the average fraction of the time period spent in the labor force by the labor force group, and $\bar{W}_o = 1 - \bar{W}_L$.

Table 1 provides decompositions of unemployment experience by the NLS samples of young and mature men in the years 1969-71. The young men ranged in age between 17 and 27, the older men were 48 to 62 years old. The men are classified by school enrollment status, educational attainment, and race. Unemployment followed by a return to the same employer ("recall" or "temporary layoff") is excluded from Table 1, but is included in Appendix tables.[1] The left-hand panel shows the components of levels of unemployment. The non-participation component $\frac{1}{1-\bar{W}_o}$ is the major one among students in periods 1966-69

TABLE 1

DECOMPOSITION OF INCIDENCE, DURATION AND NON-PARTICIPATION
NLS, 1969-71
(EXCLUDES TEMPORARY LAYOFFS)

| | Levels | | | |
|---|---|---|---|---|
| | U | $\frac{N}{L}$ | $\bar{W}_u$ | $\frac{1}{(1-\bar{W}_o)}$ |
| Young Whites | .052 | .328 | .136 | 1.15 |
| n | (2364) | | | |
| Students | .075 | .455 | .127 | 1.36 |
| n | (850) | | | |
| Non-students | .041 | .257 | .151 | 1.06 |
| n | (1514) | | | |
| Education | | | | |
| 0-11 | .056 | .327 | .156 | 1.10 |
| 12 | .043 | .261 | .154 | 1.06 |
| ⩾13 | .025 | .181 | .135 | 1.04 |
| Young Blacks | .089 | .458 | .165 | 1.18 |
| n | (835) | | | |
| Students | .127 | .581 | .153 | 1.43 |
| n | (217) | | | |
| Non-students | .079 | .414 | .172 | 1.11 |
| n | (618) | | | |
| Mature Whites | .018 | .090 | .194 | 1.06 |
| n | (2167) | | | |
| Education | | | | |
| 0-11 | .022 | .099 | .209 | 1.07 |
| 12 | .013 | .080 | .160 | 1.03 |
| ⩾13 | .016 | .081 | .189 | 1.04 |
| Mature Blacks | .030 | .117 | .236 | 1.08 |
| n | (967) | | | |

TABLE 1 - continued

| | Percent Differentials | | | |
|---|---|---|---|---|
| | U | $\frac{N}{L}$ | $\bar{W}_u$ | $\frac{1}{(1-\bar{W}_o)}$ |
| Young Blacks minus Young Whites | .545 | .332 | .193 | .022 |
| Students | .525 | .243 | .229 | .052 |
| Non-students | .648 | .478 | .127 | .049 |
| Young Whites minus Mature Whites | 1.02 | 1.29 | -.354 | .087 |
| Non-student Young Whites minus Mature Whites | .801 | 1.04 | -.250 | .006 |
| Young Blacks minus Mature Blacks | 1.10 | 1.36 | -.356 | .091 |
| Non-student Young Blacks minus Mature Blacks | .976 | 1.26 | -.319 | .032 |
| Mature Blacks minus Mature Whites | .473 | .257 | .195 | .019 |
| Education: | | | | |
| Less than H.S. minus H.S. | | | | |
| Non-student Whites | .273 | .226 | .011 | .032 |
| Mature Whites | .515 | .209 | .264 | .039 |
| H.S. minus >H.S. | | | | |
| Non-student Whites | .522 | .367 | .136 | .018 |
| Mature Whites | -.192 | -.012 | -.166 | -.009 |

Note: $\bar{W}_u$ = proportion of time spent unemployed by unemployed
$\bar{W}_o$ = proportion of time spent out of the labor force by labor force participants.
$\frac{N}{L}$ = incidence of unemployment
n = sample size

though not in 1969-71.[2] It is followed in relative importance by incidence and duration. Among the young incidence exceeds duration in producing the unemployment total, while the opposite is true in the older groups. Both incidence and duration are larger among blacks than whites and among the less educated youth compared to the more educated.[3] In the right-hand panel, percent differentials in the unemployment rate and its components are calculated for selected groups. Clearly, higher unemployment rates of the young are attributable to higher probabilities of unemployment; duration actually works in the opposite direction. While duration always increases with age in the white sample, the age differential for blacks is quite small in 1966-67 and 1967-69.

On average, almost 40% of all unemployed older men were on temporary layoffs and were recalled by the employer, while about 25% of the non-student young unemployed workers were recalled. Inclusion of recall unemployment shows a narrowing of the age differential in both the incidence and duration components of unemployment. This is because of the greater proportion of recall unemployment among the old.

A comparison of decompositions for 1967-69 and 1969-71 provides information about cyclical changes. Going from the tight labor markets of 1967-69 to the recession years 1969-71 we find that duration of unemployment shows a greater increase (proportionately twice as large) than incidence of unemploy-

ment, and that the age differentials widen in incidence and narrow in duration. Both incidence and duration of unemployment are more cyclically sensitive in the young than in the old labor force. Whatever the cycle phase, we conclude higher incidence is the reason for higher youth unemployment. It is, therefore, the component of major interest for our study.

## III. Short and Long-Run Unemployment Experience

The longitudinal data enable us to observe the incidence and the amount of time spent in unemployment over periods of several years. As indicated in Table 2 the average incidence in a single year (p) in the 1966-69 period was 13.5% for young white non-students. Over the 3-year period it was $P_3$ = 27.9% For the same group the average number of weeks spent in unemployment during a single year was 7.7. It was 11.3 over the 3-year period. We may define "complete persistence" in unemployment experience when the same persons are unemployed in the three year period as are in a single year. Then $P_3 = p$ and $W_3 = 3w$. "Complete turnover" is the opposite case, when those unemployed in one year are not unemployed in the other two years. Then $P_3 = 3p$ and $W_3 = w$. The actual figures are in between the extremes, so that a significant degree of persistence coexists with a great deal of turnover.

There are two possible, and not mutually exclusive reasons why the number of people experiencing unemployment sometime in an n-year period is

TABLE 2

TURNOVER AND PERSISTENCE OF UNEMPLOYMENT
NLS, 1966-69

| | p | $P_n$ | $\hat{P}_n$ | N | λ |
|---|---|---|---|---|---|
| Young Whites | | | | | |
| Students | .177 | .370 | .442 | 1023 | .727 |
| Non-students | .135 | .279 | .353 | 803 | .659 |
| Education | | | | | |
| 0-8 | .220 | .458 | .526 | 118 | .776 |
| 9-11 | .177 | .357 | .442 | 196 | .679 |
| 12 | .104 | .215 | .281 | 377 | .624 |
| 13-15 | .113 | .235 | .301 | 68 | .650 |
| 16+ | .023 | .068 | .067 | 44 | 1.04 |
| Young Blacks | | | | | |
| Students | .296 | .619 | .650 | 291 | .910 |
| Non-students | .242 | .454 | .564 | 335 | .658 |
| Mature Whites | .067 | .128 | .187 | 3459 | .506 |
| Education | | | | | |
| 0-8 | .088 | .163 | .242 | 1274 | .488 |
| 9-11 | .064 | .119 | .180 | 708 | .471 |
| 12 | .055 | .109 | .157 | 872 | .526 |
| 13-15 | .058 | .124 | .168 | 298 | .618 |
| 16+ | .028 | .064 | .082 | 343 | .667 |
| Mature Blacks | .095 | .176 | .258 | 1491 | .496 |

Note: $P_n$ = the observed probability of unemployment in an n year period.
p = an average of the n year single probabilities.
$\hat{P}_n = 1 - (1 - p)^n$ assuming p is an independent yearly probability.
$\lambda = \frac{P_n - p}{\hat{P}_n - p}$
N = sample size.

less than n-times the number of unemployed in a single year. First, the experience of unemployment in one year increases the probability of becoming unemployed the next year. The events are dependent in probability because of time or tenure dependence: the longer a person stays in the job the less likely he is to separate, hence to become unemployed. The other possibility is independence in probability over time, but differences in sizes of probability across people in the group: those with higher probabilities are more likely to be found unemployed at any time than are others. Both possibilities give rise to the persistence in observed incidence, so that $P_n < np$ and $W_n > w$.

Let us consider the two cases separately:

(1) The assumption of homogeneity, that is, $p_i = p$ for all individuals i, with time independent probabilities yields an upper limit for $P_n$ (It is clearly less than np, which would require a negative serial correlation). Denote the upper limit by $\hat{P}_n$, $\hat{P}_n = 1 - (1 - p)^n$. The observed n-year incidence is $P_n \leq \hat{P}_n$, and a natural measure[4] of the degree of persistence is $1 - \lambda$, where $\lambda = \frac{P_n - p}{\hat{P}_n - p}$. When $\lambda = 1$, there is no persistence in the unemployment experience.

(2) Assume independence, but heterogeneity. Here the group consists of individuals whose $p_i$ differ. Define $p = E(p_i)$ and $q_i = 1 - p_i$, $q = E(q_i)$. Then $E(\hat{P}_{ni}) = E[1 - (1 - p_i)^n] < 1 - (1 - p)^n$, and $1 - E[(q_i)^n] < 1 - q^n$.

The inequality holds because, as is well known $E[(q_i)^n] > [E(q_i)]^n$. In other words, if homogeneity and independence obtained within each of the subgroups differing in $p_i$, the observed $P_n$ would be smaller than $\hat{P}_n$ expected on the assumption of homogeneity of the whole group.

In Table 2, $\lambda = 65.9\%$ for young white non-students so the degree of persistence for this group is 34.1%; it is 49.4% for old NLS whites. Racial differences in $\lambda$ are small but they are not standardized by education. Among the young, persistence is greater in groups with education levels above high school and it does not change with age. Among the less educated, persistence increases with age. Apparently, tenure dependence is weaker and/or heterogeneity smaller in the young less educated than in the more educated groups. According to our analysis in the next section, this is reasonable if the less educated acquire less firm specific skills on the job. Over time there is a differentiation in these groups into people who acquire job attachments and others who continue to drift. The result is a growth of tenure dependence and of heterogeneity with age.

Of course, the observed $P_n$ will be even smaller if time dependence (or heterogeneity) obtains within the subgroups. Consequently, $\lambda < 1$ may reflect heterogeneity or time dependence or both. The data in Table 2 cannot distinguish whether it is heterogeneity or time dependence which produce a less

than proportionate increase in incidence and in time spent in unemployment. Regression analyses described in section V explore these matters further and suggest that both factors are at work in producing the result.

## IV. Incidence of Unemployment and Labor Turnover: Experience and Tenure Profiles

Since it is incidence that is responsible for high levels of youth unemployment we direct our attention primarily to the analysis of $P(u)$ and secondarily to the question why adult men experience longer spells of unemployment. Spells of unemployment occur, if at all, at the instance of job change or of movement between the non-market (household, school, the military) and the labor market. They also occur without job change in the case of recalled workers on temporary layoffs.

Unemployment incidence is definitionally related to labor turnover in the probability formula $P(u) = P(s) \cdot P(u|s)$ with recall unemployment excluded. For the sake of completeness, our findings include also recall unemployment (not shown in the text).

Published data classified by age show that the high rates of youth unemployment drop quite sharply to relatively low levels beyond the first half-decade of working life. Table 3 shows the age profiles of unemployment in relation to labor mobility. The upper panel based on a 1961 BLS survey (the last available survey of this kind) shows the incidence of unemployment among job changers. It suggests strongly that the age profile of unemployment is very much a reflection of the typical age-mobility profile. Almost half of

the job changers became unemployed during the year although this proportion increased somewhat with age. In the lower panel mobility is defined more broadly as the proportion of the labor force who have been on the current job (with the current employer) less than a year in January 1978. Unemployment incidence among all men in the labor force and not merely among job changers is shown in the lower row of the lower panel. Here the age curve of incidence is also convex as is the mobility curve, but flatter, especially beyond age 35. This is because (a) temporary layoff unemployment is included in the figures which almost doubles the incidence at older ages, and (b), even when temporary layoffs are excluded, the quit/layoff ratio declines with age.(See rows 3 and 4 of the upper panel.)Since the probability of unemployment is higher following layoffs than quits, unemployment conditional on separations increases with age. In view of the relatively minor changes in conditional unemployment, the steep decline of youth unemployment in the early years of experience can be attributed to the convex shape of the age curve in labor mobility.

Mincer and Jovanovic (1979) show that the age decline in job separations is due primarily to the fact that the probability of separating declines with tenure in the current job, whether or not the separation is initiated by the worker or the employer. The theory underlying this relation is that the informational process of job matching and the accumulation of specific capital on the job create differences between worker productivity

TABLE 3

JOB MOBILITY AND UNEMPLOYMENT

Men, 1961

| Employed in 1961 | 18-19 | 20-24 | 25-34 | 35-44 | 45-54 | 55-64 |
|---|---|---|---|---|---|---|
| % Job Changers (JC) | 23.5 | 24.4 | 14.9 | 10.2 | 7.1 | 4.0 |
| % of JC unemployed | 47.7 | 50.1 | 46.0 | 46.7 | 49.2 | 54.2 |
| % of JC laid off | 41.5 | 43.6 | 43.8 | 49.8 | 58.4 | 70.6 |
| % of JC quit | 58.5 | 56.4 | 56.2 | 50.2 | 41.6 | 29.4 |

Source: BLS, Special Labor Force Report No. 35, Job Mobility in 1961

Men, 1977

| | 18-19 | 20-24 | 25-34 | 35-44 | 45-54 | 55-64 |
|---|---|---|---|---|---|---|
| % with job tenure less than a year in Jan. 1978.[a] | 69.8 | 49.6 | 27.6 | 16.2 | 10.5 | 8.9 |
| % with unemployment during 1977.[b] | 34.5 | 32.2 | 17.7 | 11.8 | 10.2 | 9.6 |

Sources: Job Tenure of Workers, January 1978, and Work Experience of the Population in 1977, umpublished, BLS.

Note: [a] Employed in January 1978.
[b] In labor force some time during the year. Includes temporary layoff unemployment.

in the current job and elsewhere as well as differences between wages in current and alternative employments. The convexity of the tenure-mobility profile is due to the initially sharp decline in the probability of a separation following a successful job matching ("probation") period, and an eventual leveling off of P(s) following completion of specific capital accumulation in the firm. The experience (working age) profile of mobility is easily derived from the tenure profile. Given $s = f(T,x)$ where s is the mobility (separation) rate, T length of tenure, and x length of experience in the labor market:

$$(3) \qquad \frac{ds}{dx} = \frac{\partial s}{\partial T} \cdot \frac{dT}{dx} + \frac{\partial s}{\partial x}$$

The negative slope of the tenure curve (relation between tenure and separations) $\frac{\partial s}{\partial T}$ diminishes with T, and $\frac{dT}{dx}$ is positive and nonincreasing.[5] The convexity of the experience mobility curve s(x) is thus due to the convexity of the tenure curve. The "aging effect," $\frac{\partial s}{\partial x}$, steepens the slope of the experience profile but does not affect its convexity. The aging effect represents declines of mobility with experience at fixed levels of tenure, and is pronounced in quits but not in layoffs (Mincer-Jovanovic, Table 1).

The longer a worker stays in the firm the less likely he is to separate. Consequently he is less likely to become unemployed, unless separations after a longer stay in the firm carry a sufficiently higher risk of unemployment. This may be true of "permanent" (not recalled)

layoffs which are less expected by higher tenured employees, while the opposite ought to hold for quits since the opportunity cost of unemployment increases with tenure. These predictions are weakly confirmed in MID regressions, not shown here. The opposing signs of unemployment conditional on quit and layoff cancel in total separations so that $P(u|s)$ shows no clear pattern with tenure as is shown in Table 4.

Consequently, the tenure profile of unemployment should reflect the profile of separation, and the analyses of the experience profile of unemployment incidence can be represented equivalently to equation (3) in:

$$(4) \qquad \frac{dP(u)}{dx} = \frac{\partial P(u)}{\partial T} \cdot \frac{dT}{dx} + \frac{\partial P(u)}{\partial x}$$

Decline and convexity of the experience profile of unemployment is thus due, as was true of separations, to the sharp decline and convexity of the tenure profile of incidence.

A comparison of tenure profiles of incidence and of separations is shown in Table 4. Over the first few years of tenure, the decline in unemployment incidence appears to be somewhat more rapid than the decline in separations for both age and race groups. Aside from a first year decline, the probability of unemployment conditional on separation $P(u|s)$ does not change systematically. However, as we already noticed in Table 3, $P(u|s)$ is higher at older ages.

Among blacks the age differential in $P(u|s)$ varies over the business

TABLE 4

INCIDENCE OF UNEMPLOYMENT BY TENURE
NLS, 1967-69
(EXCLUDES TEMPORARY LAYOFFS AND STUDENTS)

| Tenure as of 1967 | Young White Men | | | Young Black Men | | | Mature White Men | | | Mature Black Men | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | P(U) | P(S) | P(U\|S) | P(U) | P(S) | P(U\|S) | P(U) | P(S) | P(U\|S) | P(U) | P(S) | P(U\|S) |
| 0 | .262 | .686 | .381 | .448 | .753 | .594 | .244 | .472 | .491 | .264 | .472 | .560 |
| 1 | .134 | .444 | .303 | .216 | .581 | .372 | .090 | .285 | .317 | .121 | .258 | .471 |
| 2 | .107 | .393 | .271 | .128 | .282 | .454 | .083 | .208 | .300 | .300 | .367 | .818 |
| 3 | .067 | .278 | .240 | .231 | .577 | .400 | .053 | .187 | .286 | .167 | .208 | .800 |
| 4 | .069 | .327 | .294 | .091 | .546 | .167 | .092 | .277 | .333 | .119 | .190 | .625 |
| 5 | .077 | .462 | .167 | .167 | .333 | .500 | .050 | .117 | .429 | .161 | .355 | .454 |
| 6 | .059 | .118 | .500 | .000 | .333 | .000 | .051 | .136 | .375 | .154 | .231 | .667 |
| 7 | .125 | .250 | .500 | .000 | .500 | .000 | .046 | .197 | .231 | .050 | .100 | .500 |
| 8 | .000 | .400 | .000 | .000 | .333 | .000 | .052 | .121 | .429 | .069 | .103 | .667 |
| 9 | 1.000 | 1.000 | 1.000 | - | - | - | .050 | .175 | .286 | .059 | .176 | .333 |
| 10-14 | .500 | .500 | 1.000 | .500 | .500 | 1.000 | .028 | .089 | .320 | .046 | .110 | .417 |
| 15-19 | | | | | | | .029 | .089 | .292 | .028 | .042 | .500 |
| 20-24 | | | | | | | .044 | .064 | .625 | .050 | .115 | .438 |
| ≥25 | | | | | | | .024 | .081 | .235 | .032 | .105 | .231 |
| Total | .178 | .518 | .342 | .337 | .642 | .525 | .066 | .163 | .382 | .095 | .179 | .519 |
| n | (1065) | | (552) | (410) | | (263) | (2084) | | (340) | (892) | | (160) |

cycle. It is observable in 1969-71, but not in 1967-69. As noted before, a similar cycle pattern was observed in age differentials in duration. The age increase in $P(u|s)$ arises mainly from the increase in the layoff/quit ratio (apparent in Table 3), but also from an increase in the probability of unemployment conditional on layoff $P(u|L)$. However, $P(u|Q)$ decreases slightly with age.[6]

The age increase in the conditional probability $P(u|s)$ is the reason for the absence of an aging effect $\left(\frac{\partial P(u)}{\partial x} \text{ in eq. 4}\right)$ in unemployment in the face of a significant aging effect in separations. At given levels of tenure the difference in $P(u)$ between the young and the old white men is small although the difference is evident among the blacks who show a stronger "aging effect" in separations (temporary layoffs excluded). The age differences also increase in the recession period 1969-71.

We check on the age effect with the MID data which covers the complete age range. The absence of an aging effect in the probability of unemployment of whites is confirmed in the MID data even though the period covered (1975-76) was a period of high unemployment. A regression of $P(u)$ on experience x, defined as years spent in the labor force, yields the equation (t-ratios in parentheses):

$$(5) \qquad P(u) = .162 - \underset{(2.7)}{.006x} + \underset{(1.8)}{.001x^2}$$

When job tenure T is included in the equation, the effect of x vanishes.

Tenure effects are strong: unemployment declines twice as rapidly over a year of tenure than over a year of experience.

$$(6) \qquad P(u) = .172 - \underset{(.9)}{.002x} - \underset{(.8)}{.00004x^2} - \underset{(4.3)}{.0132T} + \underset{(2.8)}{.0003T^2}$$

Both the experience profile in (5) and the tenure profile in (6) are convex.[7] Clearly, $P(u)$ does not depend on $x$, but on $T$. In other words, unemployment declines with age not because of aging but because of the lengthening of tenure: $\frac{dT}{dx} > 0$ and $\frac{\partial P(u)}{\partial x} = 0$ in equation (4).

The conclusion must be that the short tenure level of the young is the main reason for the age differential in the incidence of unemployment. By definition, new or recent entrants and reentrants into the labor market have short levels of tenure. The fact that their unemployment incidence is not higher than the incidence of older men at comparable levels of tenure suggests that it is not behavior or circumstances peculiar to young people, but the dynamics of "job shopping" in the labor market which is largely independent of age.

Does the finding of similar incidence at comparable tenure levels of the young and the old mean that youth unemployment is not excessively high? Not necessarily. One may argue that turnover is excessively high, so that tenure is unduly short among the young. Also, one may argue that older job movers with whom we are comparing the early tenured young represent an adverse selection of unstable workers. There is some

evidence that this suspicion is correct: older men with short tenure tend to be persistent movers whose wages and wage progress over their careers are lower than those of stayers, while such differences (between movers and stayers) are negligible among the young (Mincer-Jovanovic 1979, Tables 5 and 6).

Is it excessive turnover or is it newness in the labor market that produces the high early unemployment of the young? It is possible that among workers of comparable quality a first encounter with the labor market produces more turnover and unemployment than at early levels of tenure on any subsequent job. Being new in a labor market is an experience not restricted to the young. We may, for instance, compare the young with international and internal migrants of all ages who also encounter a new labor market. Since migrants do not represent an adverse selection, indeed the opposite is argued and shown to be the case in migration studies (e.g. Chiswick 1978), their unemployment is not likely to reflect excessive turnover.

Table 5 presents comparisons between the unemployment experience of migrants (of all ages) and of young natives: while unemployment rates of young non-migrants (age 18-24) are over twice as high as the rates of adult men, the rates of men who arrived in the U.S. from abroad were twice as high as the youth rate in all age groups (panel A). The reason the immigrant rates are higher is because they had at most only a year of experience in the U.S. labor market, certainly less that the (18-24) youth

had on average. Rates of the immigrants are comparable to the unemployment rates of men who entered or reentered the labor force during the year (Panel B), and, indeed, are somewhat higher than the rates of young (18-24) men who have less than a year of experience in the labor market.

In Panel (C) immigrants (regardless of age) are compared with natives of the same educational level (high school, the largest group) by years of experience in the U.S. labor market. During the first 2 years the unemployment rate of immigrants is somewhat higher than of the young natives but it declines more rapidly. Initial handicaps (language?) in settling in a job are overcome more quickly by immigrants. The slower rate of decline among the young reflects the change from single to married status and from part-time, part-period to full-time, full-period work. Thus, although the high initial turnover and unemployment of the young men are no greater than that of immigrants, a group that is highly motivated and committed to the labor market, the decline in turnover and unemployment is slower. The growth of commitment to the labor market takes time in the transition from dependent member of parental household to head of own family, with the mix of school, leisure, and work shifting towards the latter in the allocation of time. The significance of these factors in affecting unemployment incidence is shown in regression analyses to be described in the next section.

Internal migrants represent a group which is intermediate in an information and cultural sense, between immigrants and native experienced

TABLE 5

UNEMPLOYMENT RATES OF MEN BY MIGRATION STATUS

(A) NEWLY ARRIVED MIGRANTS, MARCH 1963
(Migration after March 1962)

| | All | 18-24 | 25-44 | 45-64 |
|---|---|---|---|---|
| Non-migrants | 5.5 | 11.2 | 4.8 | 4.8 |
| Migrants | 12.2 | 15.5 | 9.2 | 16.7 |
| Immigrants | 22.1 | 22.9 | 18.0 | 22.5 |

(B) LABOR FORCE ENTRANTS
(Not in Labor Force, March 1962; in Labor Force, March 1963)

| | All | 18-24 | 25-44 | 45-64 |
|---|---|---|---|---|
| Non-migrants | 20.0 | 19.6 | 18.5 | 23.0 |
| Migrants | 18.6 | 21.5 | 15.0 | 22.4 |

Source: BLS, Special Labor Force Report No. 44, Geographic Mobility and Employment Status

(C) IMMIGRANTS AND NATIVES BY EXPERIENCE
1970 CENSUS WEEK

| Experience | 0-2 | 2-4 | 4-6 | 6-8 | 8+ |
|---|---|---|---|---|---|
| Natives | 9.3 | 6.0 | 4.7 | 4.1 | 2.0 |
| Immigrants | 11.4 | 3.5 | 2.5 | 3.4 | 1.9 |

Source: DeFreitas (1979)

(non-migrant) workers. Their unemployment rates are lower than those of immigrants during the first year in the new location and comparable to the rate of young non-migrants (row 2 of Panel A). Again this comparison is biased because the young nonmigrants have had more than one year of labor market experience, while the migrants have been only a year or less in the new location.

Table 6, drawn from the NLS data, compares the incidence of unemployment of migrants during the first four years in the new labor market with the unemployment of young men with at most 4 years of labor market experience in 1967. Migrants who were unemployed at origin just before migrating were eliminated from the sample so as to avoid a possible adverse selection which would bias upward the destination unemployment of migrants. Within-firm geographic transfers were also eliminated to avoid an opposite bias. Temporary layoffs were excluded, and the sample restricted to non-student, white men. The results are: incidence of adult married migrants was 14%, about the same as for the young, married men and 19% for the non-married adult migrants compared to 26% for young, single men. Inclusion of temporary layoff unemployment raises the figures for the young somewhat more than for the old migrants, the reverse of the general case.

We think it is fair to conclude that the major circumstance reponsible for high youth unemployment is newness in the labor market, rather than young age and unstable behavior. This is not to say,however, that the frequency of unemployment among the young stands in an immutable ratio to that

TABLE 6

INCIDENCE OF UNEMPLOYMENT
NLS WHITE MEN, 1967-69

| | All | Married | Not Married |
|---|---|---|---|
| | | (Excludes Temporary Layoffs) | |
| Mature Men 0-4 Years Residence in 1967 | .148 | .141 | .187 |
| n | (859) | (786) | (73) |
| Young Non-Students Experience 0-4 years in 1967 | .189 | .128 | .260 |
| n | (644) | (344) | (300) |
| | | (Includes Temporary Layoffs) | |
| Mature Men 0-4 Years Residence | .168 | .165 | .188 |
| Young Non-Students 0-4 Years Experience | .230 | .160 | .310 |

Note: Respondents with unemployment in place of origin are deleted.

of adults. Increases in young cohorts consequent on the "baby boom" create larger proportions of young workers with short tenure. Similarly, longer schooling means that work experience and tenure are shorter at a given age (e.g. 18 years) , so that unemployment of young non-students is more prevalent (relative to adult unemployment) in countries with higher educational attainment. Of course, the partial labor market commitment of youth in transition in school and family status is a factor in greater turnover as is the interruption of work experience by military service. Minimum wage legislation may also be important although its impact on employment and labor force participation is probably stronger than on unemployment or on turnover (Mincer 1976). Note that black youth were not included in our comparisons with migrants and we have already seen that their unemployment incidence exceeds not only that of whites but also of black adults at comparable levels of tenure, especially in early tenure where most unemployment is concentrated.

## V. Factors Affecting the Incidence of Unemployment

The apparently close relation between turnover and unemployment suggests that some or most of the variables which affect separations are factors which also affect unemployment. We ascertain these factors and the similarity of their effects in parallel regressions of separations and of unemployment incidence on the same set of independent variables.

As is well understood in the analysis of labor mobility, the observed reduction of separation probabilities as tenure lengthens may be a statistical illusion rather than a description of individual behavior. Suppose that individual propensities to move are not reduced by tenure yet they differ among workers. In that case, the estimated tenure profile of mobility S(T) observed across a sample of workers will have a downward slope and will be convex as well. Persons with high propensities to move separate at early levels of tenure while those with lower propensities stay on for longer periods. As only stayers remain in long tenure classes, the apparently declining tenure curve would level off at low separation rates in the long-tenured classes.

Much the same phenomenon may be expected to appear in the statistical treatment of unemployment incidence. Unemployment risk may not be related to duration of job tenure, yet differences among individuals in the unemployment risk to which they are subject can create exactly the same spuriousness in the tenure profile, given the relation between separation and unemployment. Actually, heterogeneity and "tenure dependence" are not mutually exclusive hypotheses regarding labor mobility and unemployment incidence. Indeed, the theory of job sorting and of acquisition of specific human capital implies heterogeneity in levels and slopes of tenure profiles (Mincer-Jovanovic 1979). Therefore, heterogeneity does not fabricate an unreal tenure curve. It merely steepens the slope of the real (average) tenure curve.

Differences in levels of tenure profiles can be indexed by observations on past mobility behavior. If so, their inclusion in the regression should reduce the bias in the tenure slope. Other measured factors represent heterogeneity not captured by the limited observations on past mobility. Their inclusion further reduces the tenure slope while increasing the explanatory power of the regressions.

A comparison of the separation and unemployment regressions shows that the probability of unemployment is, just as labor mobility, subject to tenure dependence and that individual characteristics, such as education, health, marital status, local unemployment rate, and job training, affect the probabilities of separation and of unemployment, given tenure. These regressions appear in Tables 8A and 8B for NLS young white non-students (1969-71), in Tables 8C and 8D for the MID (1975-76), and in Tables 8E and 8F for mature NLS men (1969-71). For the NLS, the dependent variables are defined as number of separations and number of unemployment spells during the period; for the MID survey, as the probability of separation and the probability of unemployment respectively. Results are similar for both number and incidence of events; however, we refer to both as incidence of unemployment and separation. Temporary layoffs are excluded. Comparable regressions covering the period 1967-69 for NLS, and 1973-74 for MID both including and excluding recall unemployment are available in the appendix. With minor exceptions, inclusion of recall unemployment yields qualitatively similar results. Sample means of the independent variables appear in Table 7.

The first column of the separation and incidence regressions in Table 8

REGRESSION VARIABLES

| Variable | Definition |
|---|---|
| X | Number of years since beginning the first job after leaving full-time school |
| T | Duration of job held at beginning of interval |
| JTRAIN | 1 if respondent attended company training school in the job held at beginning of interval |
| PTRAIN | 1 if respondent received any training aside from regular school prior to job held at beginning of interval. |
| GTRAIN | 1 if respondent received any training other than company training school while employed on job held at beginning of interval |
| LOCRATE | Unemployment rate for labor market of current residence |
| PSEP | Prior separations per year since 1966 (NLS); probability of separation per year since 1968(MID) |
| PCOND | Ratio of prior unemployment spells to prior separations (NLS); prior unemployment incidence (MID) |
| EDUC | Completed years of education |
| HLTH | 1 if health is poor |
| GOV | 1 if public employee |
| UNION | 1 if wages are set by collective bargaining |

REGRESSION VARIABLES (cont.)

| | |
|---|---|
| MARRY | 1 if married, spouse present |
| PTIME | 1 if 34 hour workweek or less |
| OLF | 1 if incidence of non-participation in current period (NLS); 1 if incidence of non-participation in prior years (MID) |
| SEP | Number of job separations |
| ENTRY | Number of spells of non-participation (NLS); 1 if incidence of non-participation (MID) |

TABLE 7

SAMPLE MEANS FOR SEPARATION AND UNEMPLOYMENT REGRESSIONS

| | NLS 1969-71 | | | | MID 1975-76 |
|---|---|---|---|---|---|
| | Young Whites | Mature Whites | Young Blacks | Mature Blacks | Whites |
| X | 4.63 | 35.64 | 4.45 | 37.02 | 18.65 |
| $X^2$ | 33.31 | 1317.16 | 30.05 | 1424.30 | 515.59 |
| T | 1.61 | 13.15 | 1.10 | 10.89 | 7.18 |
| $T^2$ | 6.95 | 313.83 | 4.84 | 236.73 | 112.13 |
| JTRAIN | .145 | - | .081 | - | - |
| PTRAIN | .167 | - | .066 | - | - |
| GTRAIN | .289 | - | .190 | - | - |
| LOCRATE | 4.88 | 3.80 | 5.24 | 4.35 | 8.38 |
| PSEP | 3.81 | .496 | 4.19 | .570 | .093 |
| PCOND | .163 | .068 | .328 | .111 | .113 |
| EDUC | 12.21 | 10.53 | 10.35 | 7.31 | 12.65 |
| HLTH | .042 | .222 | .020 | .192 | .074 |
| GOV | .114 | .187 | .109 | .231 | .196 |
| UNION | .318 | .378 | .323 | .457 | .308 |
| MARRY | .626 | .912 | .448 | .800 | .908 |
| PTIME | .137 | .086 | .167 | .137 | .030 |
| OLF | .328 | .200 | .405 | .253 | .051 |
| SEP | .852 | .278 | 1.01 | .323 | - |
| $SEP^2$ | 2.63 | .541 | 2.73 | .589 | - |
| ENTRY | .472 | - | .601 | - | .153 |
| n | 1351 | 1957 | 504 | 866 | 1562 |

TABLE 8A

THE DETERMINANTS OF SEPARATIONS
YOUNG WHITE MEN, NLS, 1969-71

| | β (1) | t | β (2) | t | β (3) | t |
|---|---|---|---|---|---|---|
| CONST | 1.12 | | .749 | | 1.50 | |
| X | -.110 | 3.23 | .064 | 1.76 | .054 | 1.42 |
| $X^2$ | .007 | 2.61 | -.003 | 1.16 | -.003 | 1.06 |
| T | | | -.310 | 6.45 | -.221 | 4.70 |
| $T^2$ | | | .026 | 4.15 | .018 | 3.01 |
| JTRAIN | | | -.276 | 2.59 | -.129 | 1.24 |
| PTRAIN | | | .083 | .81 | .091 | .92 |
| GTRAIN | | | .017 | .20 | .090 | 1.12 |
| LOCRATE | | | .016 | .66 | .008 | .34 |
| PSEP | | | .039 | 4.58 | .036 | 4.41 |
| PCOND | | | .147 | 1.80 | .045 | .57 |
| EDUC | | | | | -.064 | 3.83 |
| HLTH | | | | | -.202 | 1.16 |
| GOV | | | | | -.113 | .99 |
| UNION | | | | | -.159 | 2.10 |
| MARRY | | | | | -.261 | 3.28 |
| PTIME | | | | | .279 | 2.74 |
| OLF | | | | | .607 | 7.87 |
| $R^2$ | .008 | | .102 | | .173 | |
| $\bar{Y}$ | .852 | | | | | |
| n | 1351 | | | | | |

Note: β = regression coefficient

$\bar{Y}$ = mean of the dependent variable

TABLE 8B

THE DETERMINANTS OF SPELLS OF UNEMPLOYMENT
YOUNG WHITE MEN, NLS, 1969-71

| | β (1) | t | β (2) | t | β (3) | t | β (4) | t | β (5) | t | Spells among separators and entrants β (6) | t |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CONST | .642 | | .115 | | .650 | | .007 | | -.064 | | .337 | |
| X | -.068 | 2.61 | .029 | 1.03 | .025 | .85 | | | -.004 | .17 | .007 | .35 |
| $X^2$ | .004 | 1.79 | -.002 | .85 | -.002 | .88 | | | -.000 | .21 | -.001 | .44 |
| T | | | -.171 | 4.59 | -.120 | 3.24 | | | -.016 | .56 | -.028 | 1.02 |
| $T^2$ | | | .014 | 2.88 | .010 | 2.03 | | | .001 | .31 | .001 | .18 |
| JTRAIN | | | -.111 | 1.34 | -.016 | .20 | | | .043 | .71 | .066 | 1.06 |
| PTRAIN | | | .117 | 1.47 | .118 | 1.52 | | | .072 | 1.25 | .011 | .19 |
| GTRAIN | | | -.016 | .25 | .037 | .58 | | | -.018 | .38 | -.009 | .22 |
| LOCRATE | | | .064 | 3.41 | .056 | 3.03 | | | .054 | 3.94 | .028 | 2.28 |
| PSEP | | | .023 | 3.56 | .021 | 3.31 | | | .002 | .51 | .005 | 1.21 |
| PCOND | | | .244 | 3.84 | .169 | 2.71 | | | .153 | 3.30 | .076 | 2.14 |
| EDUC | | | | | -.043 | 3.29 | | | -.011 | 1.17 | -.015 | 1.69 |
| HLTH | | | | | -.117 | .85 | | | .002 | .00 | .008 | .01 |
| GOV | | | | | -.010 | 1.12 | | | -.046 | .69 | -.073 | 1.04 |
| UNION | | | | | .078 | 1.32 | | | .151 | 3.43 | .105 | 2.58 |
| MARRY | | | | | -.242 | 3.87 | | | -.101 | 2.17 | -.061 | 1.45 |
| PTIME | | | | | .155 | 1.94 | | | .001 | .03 | -.022 | .41 |
| OLF | | | | | .348 | 5.75 | | | - | - | | |
| SEP | | | | | | | .434 | 14.79 | .408 | 13.53 | | |
| $SEP^2$ | | | | | | | .017 | 3.95 | .019 | 4.43 | | |
| ENTRY | | | | | | | .063 | 2.31 | .031 | 1.12 | | |
| $R^2$ | .007 | | .082 | | .133 | | .505 | | .521 | | .035 | |
| $\bar{Y}$ | .452 | | | | | | | | | | .315 | |
| n | 1351 | | | | | | | | | | 737 | |

TABLE 8C

THE DETERMINANTS OF THE INCIDENCE OF SEPARATION
WHITE MEN, MID, 1975-76

| | β (1) | t | β (2) | t | β (3) | t |
|---|---|---|---|---|---|---|
| CONST | .266 | | .228 | | .452 | |
| X | -.010 | 3.92 | -.007 | 2.37 | -.007 | 2.42 |
| $X^2$ | .0002 | 2.58 | .0001 | 1.98 | .010 | 1.70 |
| T | | | -.010 | 2.51 | -.012 | 3.07 |
| $T^2$ | | | .0002 | 1.44 | .0003 | 1.95 |
| LOCRATE | | | .001 | .20 | .001 | .48 |
| PSEP | | | .166 | 3.02 | .136 | 2.44 |
| PCOND | | | .124 | 2.85 | .094 | 2.05 |
| EDUC | | | | | -.010 | 2.74 |
| HLTH | | | | | .090 | 2.64 |
| GOV | | | | | -.027 | 1.22 |
| UNION | | | | | -.024 | 1.18 |
| MARRY | | | | | -.073 | 2.38 |
| PTIME | | | | | -.122 | 2.24 |
| OLF | | | | | -.070 | 1.59 |
| $R^2$ | .024 | | .056 | | .075 | |
| $\bar{Y}$ | .149 | | | | | |
| n | 1562 | | | | | |

TABLE 8D

THE DETERMINANTS OF THE INCIDENCE OF UNEMPLOYMENT
WHITE MEN, MID, 1975-76

| | (1) β | (1) t | (2) β | (2) t | (3) β | (3) t | (4) β | (4) t | (5) β | (5) t | Incidence among separators and entrants (6) β | (6) t |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CONST | .162 | | .099 | | .296 | | .018 | | .090 | | .769 | |
| X | -.006 | 2.73 | -.003 | 1.26 | -.001 | .57 | | | -.0001 | 1.28 | .013 | 1.17 |
| $X^2$ | .0001 | 1.74 | .0001 | 1.08 | -.000 | .00 | | | .002 | .98 | -.0003 | 1.28 |
| T | | | -.008 | 2.58 | -.007 | 2.06 | | | -.001 | .46 | -.0001 | .00 |
| $T^2$ | | | .0002 | 1.63 | .0001 | 1.32 | | | .000 | .33 | -.000 | .45 |
| LOCRATE | | | .003 | 1.20 | .004 | 1.60 | | | .003 | 1.62 | .020 | 1.69 |
| PSEP | | | .100 | 2.10 | .114 | 2.52 | | | .052 | 1.40 | .076 | .47 |
| PCOND | | | .246 | 7.10 | .209 | 5.68 | | | .166 | 5.43 | .387 | 2.86 |
| EDUC | | | | | -.010 | 3.53 | | | -.006 | 2.38 | -.034 | 2.36 |
| HLTH | | | | | .050 | 1.82 | | | .010 | .42 | -.009 | .00 |
| GOV | | | | | -.043 | 2.37 | | | -.030 | 2.04 | -.042 | .47 |
| UNION | | | | | -.015 | .94 | | | -.005 | .37 | .051 | .69 |
| MARRY | | | | | -.084 | 3.40 | | | -.052 | 2.49 | -.204 | 2.20 |
| PTIME | | | | | .034 | .76 | | | .087 | 2.40 | -.125 | .46 |
| OLF | | | | | .105 | 3.00 | | | .131 | 4.48 | .239 | 1.33 |
| SEP | | | | | | | .475 | 28.08 | .451 | 26.50 | | |
| ENTRY | | | | | | | .034 | 2.01 | .018 | 1.10 | | |
| $R^2$ | .012 | | .047 | | .103 | | .336 | | .383 | | .112 | |
| $\bar{Y}$ | .094 | | | | | | | | | | .498 | |
| n | 1562 | | | | | | | | | | 231 | |

TABLE 8E

THE DETERMINANTS OF SEPARATIONS
MATURE WHITE MEN, NLS, 1969-71

| | β (1) | t | β (2) | t | β (3) | t |
|---|---|---|---|---|---|---|
| CONST | .478 | | .480 | | .294 | |
| X | -.019 | 1.71 | -.016 | 1.62 | -.005 | .56 |
| $X^2$ | .0004 | 2.19 | .000 | 1.89 | .000 | .47 |
| T | | | -.019 | 4.85 | -.014 | 3.97 |
| $T^2$ | | | .0004 | 4.08 | .0003 | 3.29 |
| LOCRATE | | | .003 | .35 | .004 | .43 |
| PSEP | | | .177 | 18.66 | .164 | 18.31 |
| PCOND | | | .080 | 2.32 | .021 | .62 |
| EDUC | | | | | .003 | .62 |
| HLTH | | | | | .042 | 1.35 |
| GOV | | | | | -.083 | 2.48 |
| UNION | | | | | -.000 | .00 |
| MARRY | | | | | -.064 | 1.41 |
| PTIME | | | | | .078 | 1.69 |
| OLF | | | | | .505 | 15.22 |
| $R^2$ | .004 | | .235 | | .326 | |
| $\bar{Y}$ | .278 | | | | | |
| n | 1957 | | | | | |

TABLE 8F

THE DETERMINANTS OF SPELLS OF UNEMPLOYMENT
MATURE WHITE MEN, NLS, 1969-71

| | (1) β | (1) t | (2) β | (2) t | (3) β | (3) t | (4) β | (4) t | (5) β | (5) t | Spells among separators and entrants (6) β | Spells among separators and entrants (6) t |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CONST | .248 | | .245 | | .266 | | .000 | | .147 | | .383 | |
| X | -.011 | 1.41 | -.010 | 1.42 | -.088 | 1.26 | | | -.006 | 1.22 | .004 | .24 |
| $X^2$ | .0002 | 1.62 | .0002 | 1.51 | .0001 | 1.25 | | | .000 | 1.34 | -.000 | .24 |
| T | | | -.006 | 2.41 | -.005 | 1.99 | | | .000 | .03 | .008 | 1.01 |
| $T^2$ | | | .0001 | 1.63 | .0001 | 1.18 | | | -.000 | .64 | .000 | .01 |
| LOCRATE | | | .001 | .09 | .001 | .16 | | | -.001 | .27 | -.002 | .10 |
| PSEP | | | .098 | 14.74 | .096 | 14.34 | | | .014 | 2.54 | .010 | .98 |
| PCOND | | | .097 | 4.00 | .086 | 3.49 | | | .077 | 4.14 | .102 | 2.04 |
| EDUC | | | | | .002 | .60 | | | .001 | .34 | .010 | 1.30 |
| HLTH | | | | | -.015 | .63 | | | -.027 | 1.54 | -.102 | 1.77 |
| GOV | | | | | -.007 | 2.70 | | | -.029 | 1.56 | -.155 | 1.89 |
| UNION | | | | | .008 | .39 | | | -.003 | .17 | -.027 | .46 |
| MARRY | | | | | -.063 | 1.87 | | | -.036 | 1.41 | -.086 | 1.05 |
| PTIME | | | | | -.011 | .31 | | | -.043 | 1.66 | -.085 | 1.10 |
| OLF | | | | | .110 | 4.45 | | | -.089 | 4.37 | | |
| SEP | | | | | | | .286 | 13.77 | .302 | 13.05 | | |
| $SEP^2$ | | | | | | | .061 | 10.35 | .054 | 8.91 | | |
| $R^2$ | .001 | | .163 | | .174 | | .516 | | .528 | | .051 | |
| $\bar{Y}$ | .112 | | | | | | | | | | .367 | |
| n | 1957 | | | | | | | | | | 391 | |

shows an experience profile which disappears once tenure is added. This means that within the observed age range (which is limited in the NLS), probabilities of both separation and unemployment are the same at given levels of tenure regardless of experience. In the complete age range (available in the MID data) the inclusion of tenure reduces but does not eliminate experience effects on separations. However, such "aging effects" are eliminated in the unemployment incidence equations.

Next the inclusion of heterogeneity indices of past behavior and of heterogeneity factors (col. 3) reduces the tenure slope both in separations and in unemployment incidence. Most of the reduction is achieved when prior mobility indices are added to tenure. As an example, which holds in all the regressions, compare col. 2 in Table 8D with eq. (6) above. Both prior separations (per year) and prior unemployment (conditional on separations) were used as indices in NLS. Prior unemployment incidence is unconditional in MID. Tenure remains significant after all other variables are included.

Three training variables were used in the young NLS regressions: company training on the current job, training prior to the current job, and off-the-job training. Of these, only the first approaches statistical significance and, as would be expected on specific capital grounds, it reduces both separations and unemployment incidence. The training effects are stronger in the 1967-69 than in the 1969-71 regressions shown here.

Unemployment incidence is positively affected by the local level of of unemployment which, however, does not affect separations. This finding appears in the NLS regressions for young men in both periods (1969-71 and 1967-69) and in MID regressions for 1973-74 and, less strongly

for 1975-76. We find also that the local rate is not related to quits, but is positively related to layoffs. These findings suggest that differences in local unemployment reflect differences in local demand for labor somewhat more clearly than differences in turnover. If it were turnover only, local rates would be positively related to separations, which is not observed. If only labor demand differs, there would be no relation between the local unemployment rate and separations, a positive relation with layoffs, both of which are observed, and a negative relations with quits, which is not observed.

Both separations and unemployment incidence are negatively related to education and to marital status among the young. Short hours (part-time work) and non-participation some time during the year ( or in prior years) are associated with higher probabilities of separation and of unemployment in the young NLS data, and in the MID data for 1973-74. (In 1975-76 part-timers appear to have fewer separations and the effect of part-time work on unemployment incidence disappears.)

Union membership reduces separations, and has no significant effect on incidence, unless temporary layoff unemployment is included when the effect becomes positive. Employment in the government sector has a weak negative effect on separation and on unemployment in the young NLS, but both effects are stronger at older ages (MID and NLS).

Bad health has no clear effects on separations and a positive effect on unemployment incidence in 1967-69 in the young NLS sample. Both effects

are positive in the MID but not clear in the older NLS samples.

The following conclusions may be drawn. Regression results strongly support the turnover hypothesis of unemployment incidence. To the extent that differences in job sorting and specific capital processes underlie variation in labor mobility across people, they are important in creating differential unemployment. Therefore, both tenure dependence and heterogeneity are characteristic of unemployment incidence as they are of separations. Factors which account for the convex (decelerating) decline of the incidence of unemployment with age are: lengthening of tenure with age, change from single to marital status, and the shift from part-time and part-period work activities to full-time work.

We should note the relevance of marital status, part-time work, and non-participation in understanding the comparison with migrants in Table 5 (Panel C). The transition from school to market and from parental to own household which is observed in a cross-section of young people is gradual. It results in a slower decline of separation (lengthening of tenure) compared to the experience of largely adult migrants whose work in the new labor market was the major reason for migration.

A comparison of unemployment P(u) regressions with separation regressions leaves out questions about the conditional probability of unemployment. This probability $P(u|s)$ enters the product in $P(u) = P(s) \cdot P(u|s)$. It was shown to increase with age in contrast to both P(s) and P(u). What are the factors associated with $P(u|s)$ and why does it increase with age?

We try to estimate factors affecting P(u|s) in two ways. In "augmented regressions" we add separation variables to all the others (col.5 of the Tables) and study factors affecting unemployment given separations. The alternative procedure is to restrict the regressions to workers who moved, that is to job separators as well as to entrants and reentrants (col. 6). These we call "restricted regressions."

In both kinds of regressions the variables which remain significant are: the local unemployment rate, prior conditional unemployment, marital status, education, and less clearly part-time work. Union membership becomes positive and significant at least in the 1969-71 period. Similar results are found in MID regressions. The variables show higher t-scores in the restricted regressions (col.6), but the bulk of "explanatory power" in the augmented regressions is due to the turnover variables. For example, in the 1969-71 NLS sample of young men these variables produce an $R^2 = .505$ which increases only to .521 when all the factors are added.

Table 3 suggested that both separations and unemployment are more heavily weighted by layoffs than by quits at older ages. Some of the variables which are significant in affecting conditional unemployment in the regressions are apparently more closely associated with layoff unemployment. This is true of the local unemployment rate, as already noted. Prior conditional unemployment must be weighted toward layoff, since unemployment conditional on layoffs is twice as high as unemployment conditional on quit. The same holds for unemployment of union members. However, education,

marital status, and short hours affect both quits and layoffs and so affect the conditional in each type of separation.

Altogether, the NLS regressions are not very helpful in explaining the age increases in conditional unemployment. Lower levels of education and of health and more frequent union membership among the old account for a part of it. The other variables have none or even opposite effects on age patterns. That the variables we were able to measure do not account for the growth of conditional unemployment with age is apparent in observing the effects of experience on incidence in the regressions restricted to job movers. The effect is positive in the older NLS (ages 48 and over), and less so in MID (average age near 40) before and after all other variables are included. There are no experience effects in the restricted regressions within the first decade of work experience ( the young NLS sample). Evidently, the probability of unemployment when separating increases at adult ages within each of the classes (levels) of the variables we have measured.

## VI. Conditional Unemployment and Age Differences in the Duration of Unemployment: A Search Model.

Although we are not able to ascribe much of the higher conditional unemployment at older ages to the factors we have measured, we know that it is largely associated with the increased layoff/quit ratio. Why do quits decline more rapidly at older ages than layoffs?

At given tenure levels a worker's incentives to quit decline as he ages because the payoff period to whatever benefit the quit produces is getting shorter. Furthermore, we suggest that potential job changers encounter a diminished probability of finding a job at older ages. There are several possible reasons for this. Short prospective tenure inhibits hiring by employers in the presence of hiring or training costs. A record of job mobility at older ages is a deterrent to hiring for the same reasons, insofar as it suggests a higher probability of further separation as it does in our findings. On the supply side, workers' human capital even if not specific to the firm becomes progressively more specialized to a narrower cluster of firms within an industry or occupation. The proportion of job changers who also change industry and occupation diminishes at older ages.[8]

In the terminology of search models we argue that, on average, older workers who separate from jobs have a lesser probability of finding a job per unit of search time, not because they are holding out for a higher acceptance wage within the relevant wage offer distribution though it is true of some, but because the probability of getting any offer, that is the probability of finding a vacancy, is smaller. On this assumption we can show that olderworkers who separate will search longer when unemployed and quit less frequently while their acceptance wage will be relatively lower, so the wage gain will be smaller (or negative) for older job movers than for younger ones.

In the standard search model the individual samples from his wage offer distribution f(w) receiving one offer per unit of time. The worker decides on an optimal wage floor which equates the gain from an additional unit of search to the cost of it. The resulting rule is:

$$P_a(\bar{W}_a - W_a) = c = W_a - z \tag{7}$$

where $W_a$ is the lowest acceptable wage, $P_a$ is the probability of getting an acceptable wage offer, that is of $W \geq W_a$, $\bar{W}_a$ the mean of all acceptable wage offers; c is the (marginal) cost of search which includes opportunity and other costs. The highest opportunity cost or foregone wage is $W_a$. Income offsets z which are contingent on continued search such as unemployment compensation or the current wage when searching on the job enter costs with a negative sign. Duration of search D is inverse to $P_a$. In this model search is longer the higher the acceptance wage which is higher the lower cost of search.

Now the probability of accepting a wage offer must be redefined given that the probability of finding any offer in a unit period can be less than 1. A lesser frequency of vacancies may be a result of depressed business conditions in general, or depressed markets for a particular type of labor, or a function of lesser efficiency or intensity of search. The optimum condition becomes:

$$p \cdot P_a(\bar{W}_a - W_a) = c = W_a - z \tag{8}$$

Here p is the probability of finding a job offer, $P_a$ the probability of finding an acceptable job conditional on finding a vacancy, and $p \cdot P_a$ is the probability of finding an acceptable job. D is now the inverse of the product $p \cdot P_a$. As before, changes in c produce a positive relation between $W_a$ and D. However, changes in p over the business cycle or otherwise, or differences in p across people tend to produce a negative correlation between $W_a$ and D.

A reduction in p leads to a downward revision of $W_a$ ,hence to an increase in $P_a$. The question is whether $p \cdot P_a$ will rise or fall in (8). No perfectly general answer can be given to this question, but a most plausible answer is that $(p \cdot P_a)$ will fall, hence the duration of search will lengthen even though $W_a$ is revised downward in consequence of a fall in p.[9] It is easy to see that the difference $(\bar{W}_a - W_a)$increases as $W_a$ is lowered in a uniform or triangular wage offer distribution. When $W_a$ is reduced, $\bar{W}_a$ is reduced by a smaller amount, so that $p \cdot P_a$ must fall, if c is fixed or reduced. Actually, c will be reduced since lowering of $W_a$ will lead to a fall in foregone wages when search is continued..

An increase in $(\bar{W}_a - W_a)$implies an increase in the ratio $\frac{\bar{W}_a}{W_a}$ when $W_a$ is reduced. It can be shown that $\frac{d(\bar{W}_a/W_a)}{d\,W_a} \leq 0$ for a wide class of

functions . Consequently our conclusions hold more generally, since eq. (8) can be rewritten in ratio form:

$$(9) \qquad p \cdot P_a \left( \frac{\bar{W}_a}{W_a} - 1 \right) = 1 - \frac{z}{W_a}$$

Only an unusually high skew in the distribution, such as in the Pareto distribution, yields a fixed $\frac{\bar{W}_a}{W_a}$ whatever the position of $W_a$. Even then $p \cdot P_a$ will fall as the right hand expression does.

The conclusion that a lower p is very likely to produce longer search and lower acceptance wages holds both for unemployed and for employed searchers. In the latter case $c = W_a - W_o$, where $W_o$ is the wage paid on the job. An increased duration of search on the job, of course, means a reduction in the frequency of quit.

In sum, workers facing fewer vacancies in their search may be expected to have a longer duration of search and a lesser wage gain when unemployed, and to inhibit their job change (quit) when employed. These conclusions are consistent with worker behavior during the business cycle: duration of unemployment increases and quits decline while layoffs increase, partly because employment demand declined and partly to substitute for a decline in attrition (quits). Note that in contrast to other models, this explanation of behavior during the business cycle does not assume myopia, or lags in adjustment. [10]

Applying the same model to the life-cycle we may argue that either p or c decline at older ages. A decline in c is not plausible except very

early when labor market entrants become eligible for unemployment compensation. A decline in c would lead to increases in $W_a$ and in wage gains, but the opposite is implied by a fall in p and is observed. The implications that older men have a longer duration of unemployment, a reduced $\frac{Q}{L}$ ratio, and a lower $W_a$ when changing jobs are strongly confirmed by the data in Table 9. The shorter duration of unemployment of the young is also due partly to relatively frequent inter-labor force mobility. Again, this is characteristic of very early labor force behavior and cannot account for the age-uptrend in duration of adult unemployment. Nor can this upturn be ascribed to the somewhat longer duration of layoff than of quit unemployment. Duration increases with age in both cases. Table 9 shows that a similar search interpretation can be given to unemployment differentials by race and, somewhat less clearly, by education. We elaborate on the race differentials in the next section.

Although we have no direct evidence on the reduction of p at older ages, $P(u|L)$ may be a good index. It increases with age, is inverse to education and is higher for blacks. The only exception is that $P(u|L)$ is less for the older, more educated whites compared to young whites in the same category.

In sum, as large as they are, age differentials in unemployment rates are attenuated by the longer duration of unemployment and higher probability of unemployment of older movers. Both the longer duration and the higher

TABLE 9

CONDITIONAL UNEMPLOYMENT AND DURATION
NLS, 1967-69
(EXCLUDES TEMPORARY LAYOFFS AND STUDENTS)

| | P(U\|S) | P(U\|L) | Q/L | Average Duration | Δw | |
|---|---|---|---|---|---|---|
| Young Whites | .342 | .573 | 4.66 | 5.30 | .816 | .816 |
| Education | | | | | | |
| 0-11 | .423 | .641 | 4.26 | 5.74 | .827 | .827 |
| 12 | .329 | .546 | 4.78 | 5.20 | .842 | .842 |
| >13 | .218 | .471 | 5.36 | 3.93 | .744 | .744 |
| Young Blacks | .525 | .607 | 3.03 | 6.33 | .608 | .608 |
| Mature Whites | .382 | .623 | 1.62 | 9.99 | .658 | .658 |
| Education | | | | | | |
| 0-11 | .443 | .655 | 1.25 | 9.90 | .543 | .543 |
| 12 | .313 | .640 | 2.20 | 10.29 | .322 | .322 |
| >13 | .268 | .385 | 3.00 | 10.03 | 1.830 | 1.830 |
| Mature Blacks | .519 | .725 | 1.17 | 11.35 | .414 | .414 |

Note: w = wage gain from job change.

conditional probability of unemployment of older men can be ascribed to the decline in the probability of finding vacancies at older ages. Young white job changers face, on average, a more favorable environment in this respect.

## VII. Black-White Differences in Youth Unemployment

Black youth unemployment has grown relative to white youth unemployment over the past two decades or longer. A fuller understanding of the present differential, therefore, requires an analysis of this trend. This is beyond the scope of our present work. We did replicate the statistical analyses on black data, and report some of the findings.

The salient features in the racial unemployment differentials are: higher incidence, longer duration, and greater non-participation among black youth as shown in Table 1. Those differences hold for both students and nonstudents. Age comparisons in 1966-67 and 1967-69 show that the duration of black youth unemployment is not much shorter than the duration of unemployment of older blacks. Since the race differential in duration of older men's unemployment is small, it is not clear whether our NLS sample of older blacks understates their adverse position, or whether our findings about the young are, indeed, an indication of deterioration of labor market conditions in present cohorts of black youth. But these inferences are not mutually exclusive.

The longer duration of black youth unemployment compared with white youth is mirrored in Table 4 in higher conditional unemployment at each level

of tenure. The higher incidence of unemployment of black youth is due both to the higher separation rates and to higher conditional unemployment at fixed levels of tenure. The result is that while the black separation rates are 20% higher than the white rates, the black incidence of unemployment is twice as high as the white.

Table 9 shows also that the black conditional unemployment $P(u|s)$ is higher than the white largely because $\frac{Q}{L}$, the quit/layoff ratio is lower, and also because both conditionals $P(u|L)$ and $P(u|Q)$ are higher.[11] By the search model argument of the preceding section, we may conclude that because blacks face a lower probability of finding vacancies than whites do, their duration of unemployment is longer, wage gain smaller, and quit/layoff ratio lower. It has been noted that black quit rates are not higher than rates of whites.[12] In our interpretation, this does not suggest an equally stable work experience: total separations of blacks are higher, but quits are inhibited because of an adverse labor market, and some of the excess layoff is in part a substitution for reduced quit.

Some of the factors that appear to influence the higher black separation rates and their slower decline with experience are suggested in comparisons of black and white regressions in Tables 10A and 10B. The effects of experience on separations and on unemployment incidence of blacks are not significant in the MID sample and positive in the young NLS sample. These findings may not be inconsistent, since the quadratic experience term in in the NLS black regression has a negative coefficient and implies that the

positive effect vanishes within less than a decade (the MID sample is over a decade older). Similarly, tenure is not significant in the black MID sample, though it is negative and significant in the NLS sample of young blacks. The tenure effects are somewhat weaker, and the effect of training on the current job is, if anything, positive, rather than negative in the black sample. This suggests that blacks receive not only less training, but also a lesser specific component of it. Marital status, which reduces separations of whites, has little effect on separations of blacks in NLS and MID and on unemployment of blacks in MID. Education reduces unemployment of blacks in 1973-74 but not in 1975-76 in the MID sample. At the same time, prior unemployment conditional on separation predicts future separations more sharply among blacks than among whites, that is, black movers who encounter unemployment are more likely to separate from jobs than are those who move without unemployment and more than comparable whites. Taken together, these effects may also explain why over the early years of experience the decline in separations and in unemployment incidence is not pronounced among non-student blacks, when it is for whites.

So much for the differential regression effects as estimated in the regression coefficients. Differential characteristics of black youth also contribute to the higher unemployment. On average, black youths had less tenure, less training, lower education, fewer married, more working part-time and intermittently.

In our regression designed to spot factors influencing conditional

TABLE 10A

THE DETERMINANTS OF SEPARATIONS
YOUNG BLACK MEN, NLS, 1969-71

| | β (1) | t (1) | β (2) | t (2) | β (3) | t (3) |
|---|---|---|---|---|---|---|
| CONST | 1.32 | | .482 | | .432 | |
| X | -.072 | 1.24 | .129 | 2.02 | .150 | 2.38 |
| $X^2$ | .000 | .00 | -.012 | 2.36 | -.014 | 2.77 |
| T | | | -.222 | 3.59 | -.155 | 2.59 |
| $T^2$ | | | .019 | 3.04 | .013 | 2.22 |
| JTRAIN | | | -.115 | .55 | -.027 | .13 |
| PTRAIN | | | .154 | .66 | .257 | 1.16 |
| GTRAIN | | | .125 | .86 | .243 | 1.72 |
| LOCRATE | | | .012 | .38 | .005 | .16 |
| PSEP | | | .070 | 4.71 | .074 | 5.21 |
| PCOND | | | .267 | 2.66 | .244 | 2.46 |
| EDUC | | | | | -.012 | .58 |
| HLTH | | | | | -.264 | .68 |
| GOV | | | | | -.346 | 1.94 |
| UNION | | | | | -.489 | 4.17 |
| MARRY | | | | | .003 | .03 |
| PTIME | | | | | .377 | 2.60 |
| OLF | | | | | .528 | 4.77 |
| $R^2$ | .023 | | .126 | | .203 | |
| $\bar{Y}$ | 1.01 | | | | | |
| n | 504 | | | | | |

TABLE 10B

THE DETERMINANTS OF SPELLS OF UNEMPLOYMENT
YOUNG BLACK MEN, NLS, 1969-71

| | (1) β | (1) t | (2) β | (2) t | (3) β | (3) t | (4) β | (4) t | (5) β | (5) t | Spells among separators and entrants (6) β | (6) t |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CONST | .931 | | .230 | | -.200 | | .038 | | -.404 | | .188 | |
| X | -.045 | .86 | .117 | 2.50 | .167 | 2.95 | | | .082 | 1.77 | .016 | .71 |
| $X^2$ | -.001 | .19 | -.011 | 2.44 | -.014 | 3.15 | | | -.006 | 1.75 | .000 | .11 |
| T | | | -.196 | 3.53 | -.149 | 2.76 | | | -.062 | 1.39 | -.085 | 2.35 |
| $T^2$ | | | .017 | 3.14 | .014 | 2.66 | | | .007 | 1.59 | .004 | 1.10 |
| JTRAIN | | | .284 | 1.53 | .332 | 1.84 | | | .362 | 2.47 | -.114 | .69 |
| PTRAIN | | | .123 | .59 | .113 | .56 | | | -.015 | .08 | -.041 | .35 |
| GTRAIN | | | .156 | 1.21 | .198 | 1.56 | | | .058 | .56 | -.018 | .13 |
| LOCRATE | | | .016 | .55 | .020 | .75 | | | .020 | .89 | .037 | 2.63 |
| PSEP | | | .046 | 3.40 | .051 | 3.96 | | | .012 | 1.11 | -.021 | .95 |
| PCOND | | | .265 | 2.94 | .185 | 2.07 | | | .049 | .66 | .010 | .16 |
| EDUC | | | | | .014 | .71 | | | .018 | 1.17 | -.007 | .65 |
| HLTH | | | | | .868 | 2.50 | | | 1.000 | 3.55 | .076 | .50 |
| GOV | | | | | -.158 | .99 | | | .222 | .17 | -.038 | .44 |
| UNION | | | | | -.185 | 1.75 | | | .090 | 1.04 | .090 | 1.68 |
| MARRY | | | | | -.237 | 2.30 | | | -.250 | 2.98 | -.119 | 2.19 |
| PTIME | | | | | .220 | 1.69 | | | .019 | .17 | .052 | .88 |
| OLF | | | | | .523 | 5.26 | | | - | - | | |
| SEP | | | | | | | .673 | 9.85 | .637 | 9.07 | | |
| $SEP^2$ | | | | | | | -.026 | 1.93 | -.023 | 1.70 | | |
| ENTRY | | | | | | | .313 | 2.04 | .077 | 1.59 | | |
| $R^2$ | .018 | | .102 | | .179 | | .435 | | .458 | | .050 | |
| $\bar{Y}$ | .708 | | | | | | | | | | .268 | |
| n | 504 | | | | | | | | | | 329 | |

unemployment the clues for understanding why such unemployment is higher for blacks are sparse. Education has no effect on blacks while it was negative for whites. Again, the likely conclusion is that the conditional unemployment of blacks is higher because their quit/layoff ratio is lower at all levels of the factors.

Our findings convey some impressions of greater job instability of blacks which is partly due to lesser training and to fewer specific components of job experience, to greater non-participation, to weaker effects of education and of family status. Greater difficulties in job finding are consistent with longer duration of unemployment, inhibition of quits, and augmentation of layoffs. We do not know, however, how much of the difficulties are matters of discrimination, of perception of potential productivities by employers or of informational efficiency of job search. In contrast to the whites,unemployment of young blacks is higher than unemployment of older blacks at fixed tenure levels as we noted in Table 4. Also, the race differential in duration is larger at young than at older ages. Both of these findings may be a reflection of the deterioration in labor market conditions of recent cohorts of young blacks.

La plus ça change...?

A 1969 survey of research on youth labor markets concluded that "The normally high level of teenage unemployment is due primarily to the fact that so many teenagers are labor market entrants or reentrants rather than to

their deficiency or instability as employees."[13] We amend this conclusion by interposing a continuum of job experience and showing how it translates into a decelerating age decline in the incidence of unemployment.

Our evidence is based on far richer data than were available to the researchers in the 1960's. But we do face a question of data comparability: the NLS shows lower unemployment rates for young non-students, consequently a smaller age-differential than the CPS does. Yet our findings of no "aging effects" are also reproduced in the MID data, apart from being consistent with the spirit of the conclusion reached a decade ago on the basis of fragmentary, cross-sectional CPS aggregates.

Footnotes

1. Appendix tables available on request.

2. When not shown in text tables, the findings appear in appendix tables.

3. The educational differences are stronger in the 1966-69 periods.

4. This measure has sampling properties akin to the likelihood ratio, according to R. Shakotko. We do not explore these issues.

5. $\frac{dT}{dx} = (1 - s) - T_s > 0$, and $\frac{d^2T}{dx^2} < 0$. For argument and evidence see Mincer and Jovanovic 1979.

6. White non-student job quitters report a probability of unemployment of .313 in 1967-69 compared with .213 for mature men. For blacks these figures are .503 and .333 respectively.

7. Equation (6) is an intermediate step between col. (1) and (2) in Table 8D, below.

8. Unpublished work of Bartel and Mincer.

9. The same conclusion was reached independently by S. Nickell 1978.

10. See Alchian in the Phelps 1970 volume.

Footnotes (cont.)

11. See footnote 6,

12. Flanagan 1978.

13. Kalacheck 1969, p.2. Although the quote refers to all teenagers as a group, the special problems of black youth were noted by Kalacheck as well.

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