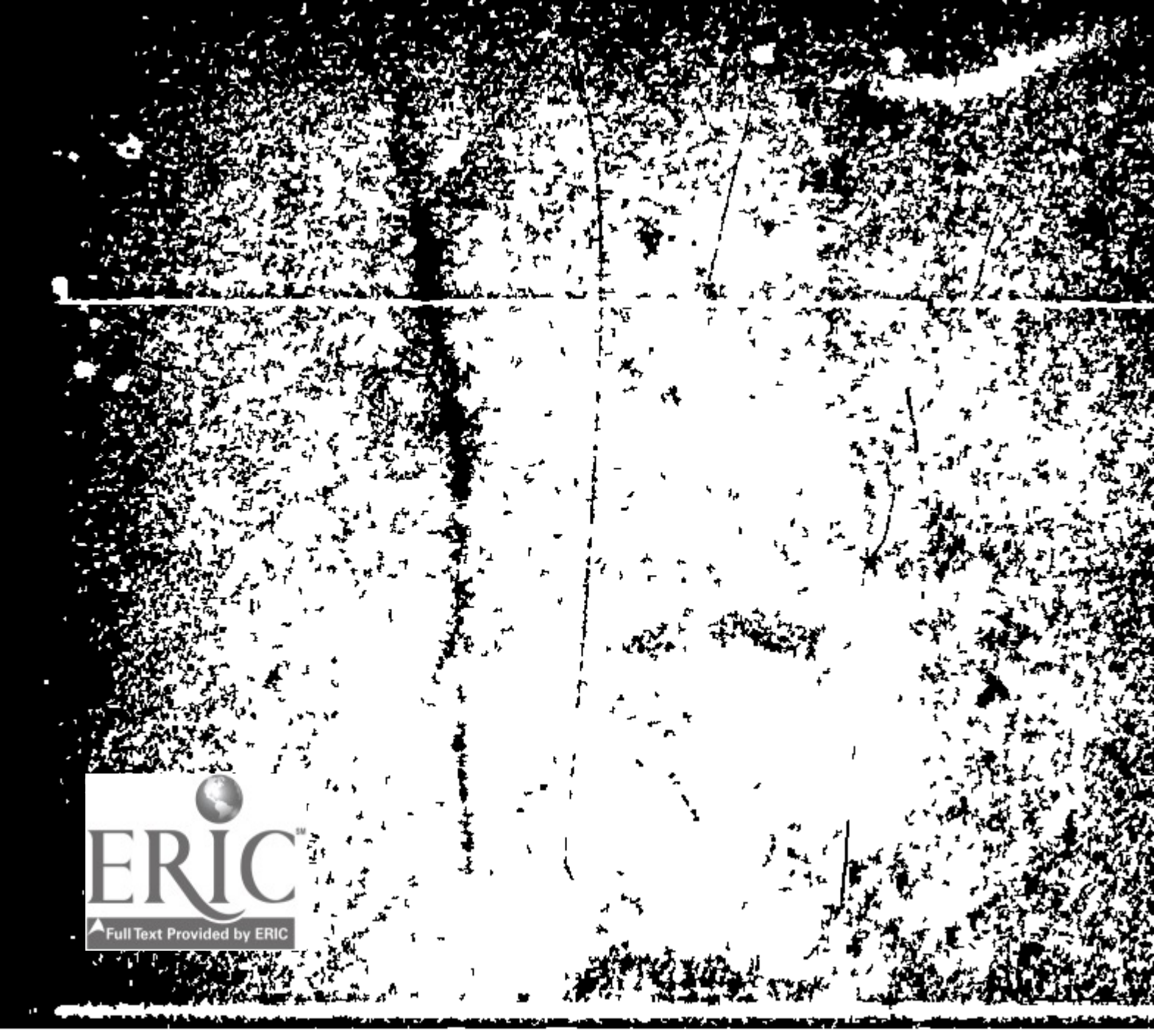
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ABSTRACT

This study analyzes the mobility of workers initially employed in low-paid occupations who moved to moderately paid occupations, based on 18,347 observations of 1970 Census data, compared to 1965 data. The study relies on the concept of labor segment, which provides an antidote to the individualistic perspective. Two broad segments, a low-paid and a mainstream stratum, are defined in order to operationalize mobility of the type that might lift a family or individual out of poverty. To permit investigation of effects due to race, gender, and industrial sector, the low-paid stratum is subdivided into eight labor segments. In its linear form, the mobility model specifies that for each labor segment the probability of upward mobility is the sum of three effects: age, years of schooling, and current occupations. The estimates indicate that the chances for upward mobility differ across low-paid occupations. In addition, there are large effects for race and gender, and a substantial effect of industrial sector on black males. The mobility flows examined through the large data base show the operation of segmentation factors. The results support the segmentation view of the labor market, i.e., a person's life chances are factors other than his or her productive potential. Socioeconomic inequality is exacerbated because gender, race, industry, and occupation are determinants of mobility. (KC)

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MOBILITY OUT OF LOW-PAID OCCUPATIONS: A SEGMENTATION ANALYSIS

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December 3, 1981

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CONTENTS

INTRODUCTION

Since Blau and Duncan (1967), the dominant analytic method in the stratification literature has been path analysis. Applied to large cross-sectional surveys, this approach has produced succinct quantitative summaries of the stratification process (e.g., Jencks et al., 1979; Duncan et al., 1972; and Featherman and Hauser, 1978). It is questionable, however, that a very parsimonious set of parameters can capture the processes of social stratification. This study also uses a large cross-sectional survey to measure the stratification process, but rather than attempt to capture the entire stratification process with a few parameters, the intent is to carefully quantify an important detail of the stratification process.

This study analyzes the mobility of workers initially employed in low-paid occupations. The focus is the occupational effect: Does the occupation of a low-paid worker strongly affect his or her chances for upward mobility? A strong occupational effect reflects the role of opportunity rather than the role of personal characteristics, and points to the structure of the labor market in explaining inequality among workers.

The notion of an occupational effect is at variance with widely supported conceptions of the labor market. The orthodox view in economics, which is implicit in much of the quantitative sociological research in social stratification, is that the labor market is sufficiently competitive to ensure that a person is rewarded according to his or her productivity. From this point of view, occupation is a veil--what ultimately matters are the characteristics of the worker as opposed to the characteristics of the job.

More compatible with the hypothesis that occupation has a substantial impact is the recent work in economics and sociology which applies a segmentation perspective to the labor market (e.g., Edwards et al., 1975; Freedman, 1976; Spilerman, 1977; Pomer, 1981). This perspective emphasizes differences among broadly defined segments or strata of workers, rather than differences among individual workers.

Stolzenberg (1975) operationalizes the notion of occupational segmentation using the three-digit occupational categories of the U.S. Bureau of the Census.[1] Stolzenberg shows that the processes governing wage attainment differ across three-digit occupations; however, he does not investigate mobility.

Leigh (1976a, 1976b, 1976c, 1978) and Rosenfeld (1980) model the mobility of workers between the three-digit

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[1] Wright (1968) relates the three-digit occupational categories to notions of class.

occupations.[2] Their models acknowledge an effect of occupation on occupational mobility, but are not based on the notion of segmentation.[3]

Rosenberg (1975, 1980) applies a dual labor market model, which can be seen as a special case of occupational segmentation: a person's opportunities are a function of whether or not his or her occupation is a primary or a secondary occupation. The dual labor market model provides a readily grasped image of an advantaged and a disadvantaged employment sector. This approach, however, has been widely dismissed for being too extreme in postulating that there is an actual division of the labor market into two homogeneous segments (Cain, 1976; Wachter, 1974).

There are five sections to the analysis. Section 1 develops a model of occupational mobility which embodies a segmentation perspective. Section 2 describes the data and variables. Section 3 uses both a linear probability form and a logit form to estimate the segmentation model. Sections 4 shows that the Blau-Duncan framework does not provide an explanation for the occupational effects, and relates the occupational effects to mobility channels. Section 5, by way of conclusion, contrasts segmentation and individualistic analyses of mobility, and summarizes the findings.

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[2] A number of studies in the Monthly Labor Review have examined occupational mobility using three-digit census occupations; most recently Byrne, 1975; Sommers and Eck, 1977; and Rosenfeld, 1979. These studies demonstrate that there is wide variability across occupations in the tendency to change occupation, and that the tendency to change occupation is strongly affected by sex, age, and race. However, they do not investigate the variation across occupations in the tendency for occupational changers to experience upward mobility.

[3] Rosenfeld uses a partial adjustment model: it takes time for a worker to acquire a job matching his or her productivity. Leigh's model, on the other hand, is based on capacity to learn: mobility mirrors the growth of worker productivity produced by learning. Using Duncan's socioeconomic index (SEI) to operationalize occupation, both approaches lead to a regression in which the dependent variable is change in SEI and the independent variables are educational attainment, other personal characteristics, and SEI of initial (or prior) occupation. The appearance of initial occupation as an independent variable is a logical consequence of the notion of partial adjustment, but its inclusion in Leigh's analysis is ad hoc.

MODEL OF OCCUPATIONAL MOBILITY

A vital characteristic of a job is the earnings it provides. Access to the mainstream of American life is dependent on such earnings (Coleman and Rainwater, 1978). The mainstream concept of social structure implies that a particularly significant phenomenon is occupational mobility from low-paid occupations to occupations which are at least moderately well-paid. Thus, let us define a low-paid stratum by identifying a set of occupations with very low median earnings, and a mainstream stratum consisting of all occupations with median earnings above a moderate level. Upward mobility is defined as movement from the low-paid stratum to the mainstream stratum, or transfer from a low-paid occupation to a mainstream occupation.

The categories of low-paid and mainstream strata are similar to the dual labor market categories of primary and secondary labor market (e.g., Osterman, 1975; Rosenberg, 1975). The low-paid stratum is roughly a subset of the occupations in the secondary labor market, and the mainstream stratum is similar to the primary labor market. However, these two categories, unlike the two categories of the dual labor market model, do not cover all occupations.[4]

What factors affect the probability that a worker will experience upward mobility? This study considers six factors -- occupation, industry, gender, race, education, and age.

There are a number of reasons a person's occupation may affect his or her chances for upward mobility. Occupations socialize workers toward particular values and norms of behavior (Piore, 1970; Kohn and Schooler, 1973). Occupation is a major determinant of social interaction networks, which are important for learning about job opportunities and obtaining preferential treatment in hiring (Granovetter, 1974). Occupation affects physical proximity to other types of jobs, and this exposure affects awareness of job possibilities. Occupations differ with regard to internal labor markets and job ladders (Doeringer and Piore, 1971). Occupations differ in their vulnerability to swings in the state of the economy (Okun, 1973). Finally, occupations differ in the skills they utilize and develop (Scoville, 1969).

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[4] Another difference is that the dual labor market model developed out of an analysis of labor market structure which included, for example, the examination of "internal labor markets" within large firms (Doeringer and Piore, 1971), whereas the notion of a mainstream stratum is motivated by a concern for social class structure.

When occupation is used in quantitative studies of social stratification, the convention is to convert a worker's occupation into a numerical variable by assigning to each occupation a point on a vertical socioeconomic continuum, most commonly the value given by the Duncan SEI index (e.g., Rosenfeld, 1980; Leigh, 1978). This study deals with occupation very differently. First, influenced by the dual labor market model, we have defined a low-paid occupational stratum and a mainstream occupational stratum to identify the critical social phenomenon of a low-paid worker experiencing substantial upward mobility. The next step is to ask whether there is an effect of low-paid occupation on the probability of upward mobility, without presuming that this occupational effect can be captured by an index, such as Duncan SEI. Thus it is desirable to include in the mobility model a separate effect for each low-paid occupation.

A strong case has been made for acknowledging a basic split of the economy into two industrial sectors. The "monopoly" or "core" sector consists of large-scale capital intensive corporations, and the "competitive" or "periphery" sector consists of relatively small enterprises that sell in highly competitive markets (Bluestone, 1970; O'Connor, 1973). Beck et al. (1978), Bibb and Form (1977), and Hodson (1978) classify the three-digit census industries into core and periphery sectors and find that industrial sector has a strong independent impact on earnings. Beck et al. (1978) and Hodson (1978) argue that the division of the economy into two industrial sectors is more important than occupational distinctions for understanding structural sources of inequality among workers.[5]

Female gender and black race may be obstacles to upward mobility. Obviously consequential are racial and sexual prejudice among employers and within unions, and stunted expectations on the part of women and blacks. But the relevance of race and gender may be traced beyond prejudiced employers and unions, and beyond the expectations of workers, to the tie between social relations in the society as a whole and social relations in the workplace. Race and gender may limit mobility into supervisory jobs since male workers may have difficulty accepting female supervision, and white workers may resist subordination to blacks; other good jobs held by white males may be unavailable to women and blacks because of the belief that workers are more cooperative if they share a common identity by race and gender (Whyte, 1949; Bergmann and Darity, 1980). Among other factors restricting upward mobility of women is the

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[5] The evidence for the impact of industrial sector, however, has been brought into question by Hauser (1980). See also the Beck et al. (1980) reply to Hauser.

selection of residential location on the basis of the husband's career. Important for blacks are the effects of segregated neighborhoods on proximity to jobs and connection to social networks.

Social class of origin is an important determinant of social connections, personality traits, and material resources, and thus may be strongly related to the availability to a low-paid worker of mainstream job options. Social class, unfortunately, is an elusive concept which is often operationalized using father's occupation. In the data analyzed in this paper, neither father's occupation nor other information on social class of origin is reported. However, years of schooling, which is reported, is known to be strongly affected by social class of origin and therefore can be viewed as an indicator of social class of origin.

From an individualistic perspective, amount of schooling reflects rational choice to invest in human. If it takes time for the employer to discover the level of human capital of the worker, then years of schooling will be positively associated with upward mobility (Rosenfeld, 1980). In addition, schooling may have a positive effect on upward mobility, since the capacity to learn from work experience may be enhanced by education (Rosen, 1972; Leigh, 1978). Thus a schooling effect in a mobility model may be attributed to either individualistic or segmentation factors, or both.

The mobility process may be strongly affected by age. Young workers exhibit exploratory behavior, while older workers are shunned by employers concerned that they may retire or be vulnerable to ill health. Thus the model is fit to workers who fall within a middle age range. In addition, age is introduced as an independent variable, since age differences within the middle age range may be consequential for mobility because of advantageous effects of experience and seniority, and disadvantageous effects of physical aging and shortened worklife potential.

The process of upward occupational mobility consists of two steps. The first step is to leave an occupation, and the second step is to enter a new occupation. This paper is limited to a consideration of the second step, gaining entry into a new occupation. Thus the sample is restricted to persons who change occupation; workers who do not change occupation are dropped from the sample.

The task before us is to empirically measure the process of occupational mobility for workers employed in one or another of a set of low-paid occupations, who change their occupation over some time period, and who are neither "young" nor "old." Of particular interest is whether some low-paid occupations offer greater opportunity for upward mobility than do others. To capture other segmentation effects, the low-paid workers may be divided into eight labor segments defined by gender, race (black or white), and industrial sector (core or periphery). The mobility model

should be specified in a way that allows for the possibility that the mobility process is different for each labor segment. Such a model may be formalized with the following equation:

$$PROBUP = f(OC, SEG, ED, AGE, e) \qquad (1)$$

where OC is initial occupation, SEG is initial labor segment, ED is schooling, AGE is age, and e represents stochastic and unmeasured factors. PROBUP is the probability of moving to a mainstream occupation. Before selecting the functional form for such a model, let us describe the available data.

THE DATA

The 1970 Census of Population provides a unique opportunity for studying mobility. For 3 percent of the population, the 1970 Census contains information on both occupation at the time of the survey in 1970 and occupation in 1965.[6] The extremely large size of this data base, which covers about two million workers, makes possible analysis of occupational mobility for very narrowly defined categories of workers.[7]

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[6] The 1980 Census of Population, unfortunately, does not provide information on previous occupation. For discussion of shifts over time in the patterns of intragenerational mobility, see Rosenberg (1981).

[7] The data base was assembled from the three one-in-a-hundred 1970 public use samples based on the long-form questionnaire. The long-form was administered to 5 percent of the population, and each of the one-in-a-hundred public use samples constitutes one fifth of this 5 percent sample. The three public use samples correspond to three options for geographic information: (1) county groups, (2) states, (3) geographic divisions with neighborhood characteristics. The sampling unit is the housing unit (household, vacant unit, or person in group quarters). Thus in addition to person records, the public use samples contain housing unit records, and, in the case of the third option, records describing neighborhood characteristics. The data file we worked with consists of person records obtained by combining data from the housing unit records and person records of the public use samples. Complete documentation for the three one-in-a-hundred public use samples is provided by U.S. Bureau of the Census (1972). Unfortunately the 1980 Census of Population does not contain information on previous occupation.

The data analyzed in this study consist of 18,347 observations. The observations are the white or black persons in the census data base who were employed in 1965 in one or another of 17 low-paid occupations, and who were employed in a different occupation in 1970 than in 1965. The 17 occupations are selected on the basis of three criteria. First, the median earnings are very low, below $4000 in 1969.[8] Second, the occupation is large enough that there are at least 25 white male observations in the data base. Third, the occupation is a manual, nonfarm occupation. In addition, the sample is restricted to workers who in 1965 were between the ages 26 and 49. Finally, a small number of observations, 101, are excluded because industry in 1965 is not reported.

Ten of the 17 low-paid occupations are categories of service workers: cleaners, cooks, dishwashers, fountain workers, waiters and waitresses, food service workers, personal attendants, porters , crossing guards, and household servants. Five of the occupations refer to labor categories: carpenters' helpers, gardeners, lumberworkers, stockhandlers, and vehicle washers. Finally there are two operative categories: garage workers, and produce graders. The 17 occupations are listed in Table 1 along with their three-digit census codes. Table 1 shows how many observations are in each of the low-paid occupations, and decomposes the sample not only by occupation but also by race, gender, and industrial sector. Industrial sector refers to the core/periphery distinction as operationalized in Beck et al. (1978).

The workers in the low-paid stratum are divided into eight labor segments on the basis of race, gender and industrial sector. The eight segments are black females employed in the periphery sector, white females in the periphery, black males in the periphery, white males in the periphery, black females in the core, white females in the core, black males in the core, and white males in the core. Thus the low-paid stratum is divided in two ways--into 17 low-paid occupations, and into eight labor segments.

Table 1 presents the occupational distributions for the eight labor segments, and shows clearly that there is severe occupational segregation by gender and race. More than half of the black women are household maids, and close to half of the white women are waitresses. Differences in upward mobility by race and sex are part of the explanation for occupational segregation. (See Snyder et al., 1978 for

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[8] The median earnings values are earnings for 1969 by occupation at time of survey, which is about April 1, 1970. The values are for males, 16 years and over in the experienced civilian labor force (ECLF). The data are taken from column 3 of Table 1 in U.S. Bureau of Census (1973).

discussion of occupational segregation.)

The term labor segment is an analytical construct which can be used in a number of ways. In this paper the term labor segment refers to a subdivision of the low-paid stratum. This usage may be confusing, since the 17 low-paid occupations also constitute subdivisions of the low-paid stratum, and effects of occupation are segmentation effects just as are effects of race, gender, and industrial sector. It is helpful, however, to restrict the term labor segment to refer to race/gender/industry groups within the low-paid stratum. It is particularly useful for the analysis of mobility channels, which are discussed in detail in the final section of this paper. Mobility channels connecting low-paid occupations and mainstream occupations are characterized by very different rates of flow for each of the eight labor segments.[9]

The analysis is concerned with two ratio-level independent variables, ED and AGE. AGE is age of worker, measured in years, as of 1970. ED measures educational attainment as of 1970. ED may be interpreted as final grade attended plus two.[10] Table 2 displays, for each of the eight labor segments, the means and standard deviations for these two variables.

The labor segments are quite similar in terms of schooling and age. The ED means range from 11.0 to 12.5, corresponding roughly to a range of from 9 years of schooling to 10.5 years of schooling. The AGE means range from 40.8 to 45.0. Women on average are older and slightly more educated than men. Whites are on average slightly older and more educated than blacks, except that white and black men are about the same in age.

To operationalize upward mobility, the lower boundary of the mainstream occupational stratum is defined by median earnings of $6000 in 1969. This boundary roughly distinguishes workers who earn enough to maintain families in the social mainstream (Coleman and Rainwater, 1978). The dummy variable UP takes on the value of 100 for those low-paid workers who move into the mainstream stratum, and otherwise the value of 0.

The mean value of the variable UP for a labor segment is the percentage of persons in that segment who move into

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[9] There is another possible meaning for the term labor segment. On an aggregate level the low-paid stratum might also be termed a labor segment.

[10] ED indicates highest grade attended and is 0 if never attended school, 1 for nursery school, 2 for kindergarten, 3 for first grade, ... , 14 for twelfth grade (last year of high school), 15 for first year of college, ... , 18 for fourth year of college, 19 for "college 5," 20 for "college 6 or more."

the mainstream. The mean of UP is interpretable as an unadjusted estimate of the probability of upward mobility. Table 2 gives mean UP values for the eight labor segments.

[Table 2 about here.]

These estimated probabilities of upward mobility do not take into account differences across labor segments in occupational distribution, and in the distributions of AGE and ED. The probabilities, which are for persons who change occupation, range from 18.4% to 66.1%. The pattern reveals large differentials favoring men over women, and whites over blacks.

METHOD AND RESULTS

Linear Probability Model

The linear probability form is an appealing way to specify the mobility model given by equation (1). Such a form is economical to fit and straightforward to interpret. It is likely to produce results similar to those produced using a logit or probit form, especially since, as indicated by column 2 of Table 2, the expected value of the dependent variable is not likely to be close to either 0 or 100. Thus the linear probability form is fit to the data, though a confirmatory analysis is also carried out using the logit form.

The probability of upward mobility is assumed to be determined by the following equation:

$$PROBUP = A + BED + IAGE + S, \qquad (2)$$

where

$$A = A(OC, SEG)$$
$$B = B(SEG)$$
$$I = I(SEG) .$$

PROBUP is the probability of moving to a mainstream occupation, ED is number of years of schooling (plus 2), AGE is years of age, and e is the random component. (See the previous section for precise definitions.) For each initial labor segment, there are different parameters for the effects of ED and AGE. In order to obtain a model that is feasible, given the variation in the data and the limited scope of this study, interaction of schooling and age with initial occupation is ruled out. The intercept parameter is different for each combination of initial labor segment and initial occupation. The effects of labor segment and initial occupation on the intercept are assumed to be additive, with the exception of the three combinations of labor segment and initial occupation which define very large subsamples--white female waitresses in the periphery, white

male garage workers in the periphery, and black female household servants.

The model is estimated in five steps, which are discussed fully in Appendix A. On each step, differentials which are not statistically significant are eliminated. For workers other than black males initially employed in the periphery, the fitted regression equation is:

$$PROBUP = 55.7 - 23.6\ FEMALE - 11.8\ BLACK + 2.43\ ED - 0.47\ AGE + D, \quad (3a)$$

where

D = 12.0 for garage workers;

0 for other laborers and operatives, cooks, personal attendants, and crossing guards;

-10.7 for cleaners, fountain workers, food service workers, porters, waiters and waitresses (other than white females in the periphery);

-19.9 for dishwashers, and household servants (other than black females).

For black males initially employed in the periphery, the equation is:

$$PROBUP = 83.5 + 1.07\ ED - 1.16\ AGE - D, \quad (3b)$$

where d has the values given above.[11]

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[11] As always, the findings can be criticized on the basis of specification error, especially as a consequence of the failure to include in the analysis all potentially relevant characteristics of the workers. Unfortunately the analysis is constrained by lack of data. Thus it might be argued that the segmentation variables are correlated to unmeasured components of worker productivity. Also unmeasured is whether or not a worker is "voluntarily" employed in the low-paid stratum. That is, some low-paid workers turn down jobs in the mainstream because of nonpecuniary considerations whereas other low-paid workers do not have the option of employment in the mainstream. The inability to measure this may lead to underestimation of the effects of race and gender. Furthermore, the occupational and industrial categories are not homogeneous, which is likely to result in underestimation of these segmentation factors.

As explained below, these estimates indicate a very strong impact for gender, and strong impacts for race and initial occupation. The results are explicated in two steps: first, the effect of labor segment is discussed, and second, the effect of initial occupation.

Effect of Labor Segment

The unconstrained model, which is given by equation (2), specifies different effects of age and schooling for each labor segment. However, across seven of the eight segments the differentials in the effects of age and schooling are not statistically significant. The one segment for which the effects are significantly different consists of black males employed in the periphery. For all others, a year of schooling, on average, enhances the probability of upward mobility by 2.4 percentage points; and a year of age reduces the probability by a bit under half a percentage point. Black males in the periphery benefit less from schooling and bear a heavier penalty for getting older: the schooling coefficient is roughly halved, and the age coefficient is roughly doubled.

Although seven of the segments do not manifest significant differentials for the schooling and age effects, there are strong differentials in the levels of upward mobility. These differentials can be decomposed into additive effects for race and gender.

Leaving out black males in the periphery, the differential effect of female gender is to lower the probability of upward mobility by 23.6 percentage points. This large effect, which is defined after controlling for age, schooling and occupation, is the strongest effect uncovered by the analysis. The differential effect of black race is also substantial, reducing the probability of upward mobility by 11.8 percentage points. The core/periphery distinction does not give rise to statistically significant differentials.

Table 3 displays segment mobility rates obtained by using equations (3a) and (3b) to adjust for differences

[Table 3 about here.]

across segments in age, schooling, and initial occupation. The first column gives the adjusted rates using the means over the entire sample for each of the independent variables.[12] These adjusted mobility rates may be compared

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[12] The mean age is 42.19 years, the mean amount of schooling is 12.00 (which corresponds to the tenth grade). 5.18% are garage workers; 54.97% are other laborers and operatives, cooks, personal attendants, crossing guards, and white female waitresses in the periphery; 31.10% are other service workers; and 5.18% are dishwashers and household servants (other than black females). The second and third columns differ from the first column in specification of the

with the actual mobility rates displayed in the second column of Table 2.

The adjusted segment differentials are less pronounced than the actual differentials, but the effects of gender and race remain striking. Let us consider, for example, the largest differential. The actual mobility rate of white males in the periphery is 3.6 times that of black females in the periphery. The adjusted mobility rate of white males in the periphery, in contrast, is 2.4 times that of black females in the periphery. Thus about a quarter of the actual differential is attributable to differences in age, education, and initial occupation.[13]

The relative position of the eighth labor segment, black males in the periphery, differs with age and schooling. The relative position of this segment is best at young age and low education, and worst at old age and high education. To capture the best situation for black males in the periphery, column 2 displays the predicted segment mobility rates assuming a young age and a low level of education (AGE=31, ED=8); to capture the worst situation, column 3 displays the rates assuming an older age and a higher level of education (AGE=53, ED=16). Thus Table 3 shows that for young, poorly educated blacks upward mobility is more likely in the periphery than in the core (column 2). At the overall means for age and schooling, however, black males are better off in the core by about 5 percentage points (column 1). At high levels of schooling and older age, black males in the core have a large advantage of almost 20 percentage points over black males in the periphery (column 3). The older well-educated black males in the periphery, furthermore, are worse off than white women of the same age and schooling, and they are only slightly more advantaged than similar black females.

Effect of Initial Occupation

The low-paid occupations divide into two groups on the basis of their estimated effects on upward mobility. The advantaged group consists of all the operative and laborer occupations as well as three of the service occupations (cooks, personal attendants, and crossing guards). The relatively disadvantaged group consists of the seven other service occupations. The differential effects of being in one group rather than the other is estimated to be, depending on the two occupations compared, at least 10.7 percentage and up to 31.9 percentage points.

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values for the age and schooling variables.

[13] The actual differential is 66.1%-18.4%=47.7% (table 2, column 2), and the adjusted differential is 61.7%-26.3%=35.4% (table 3, column 1).

Among the relatively advantaged occupations, the occupation of garage workers stands out as being exceptionally advantaged, with a 12.0 percentage point differential relative to the other relatively advantaged occupations. Among the relatively disadvantaged, dishwashers and household servants are especially disadvantaged with a 9.2 percentage point differential relative to other disadvantaged occupations.

As specified by equation (2), for the most part the model rules out the possibility that the effect of initial occupation may vary across the labor segments. However, the model does allow for three instances of interaction by introducing an additional parameter for each of three combinations of labor segment and initial occupation: white female waitresses employed in the periphery, white male garage workers employed in the periphery, and black female household servants. Estimation of these additional parameters is feasible because these three groups each contain a very large number of observations. Two of these interaction parameters produce statistically significant differentials, thus requiring some qualification of the above description of occupational and segment effects.

In general, workers have better mobility prospects if they work as an operative or laborer or in one of the three advantageous service occupations mentioned above. For white females there is evidence for the following exception. Working as a waitress in the periphery is not as disadvantageous as most other service occupations and roughly as advantageous as working as an operative or a laborer.

Another generalization is that household servants are exceptionally disadvantaged. This is not the case for black females. That is, a black female does not gain significantly from being in a service occupation other than household servant.

These findings can be usefully summarized using the concept of linkages between low-paid occupations and mainstream occupations. The linkages are generally weaker for service occupations than laborer and operative occupations, weaker for women than men, and weaker for blacks than whites. Having quantified these segmentation effects, this paper has three remaining tasks: (1) confirm the results using a logit form for the mobility model; (2) compare the findings to the implications of other quantitative stratification models; (3) relate the linkages to specific mainstream occupations, and to specific channels of mobility from low-paid occupations to mainstream occupations.

Logit Model

In this section, a logit form of the mobility model is fit to the data. The logit form specifies nonlinear, interactive effects. The question is whether the findings

are sensitive to such changes in model specification.

To rationalize the logit specification, it is helpful to introduce the unobservable variable y* to measure the degree to which a worker is advantaged. The variable y* is to be viewed as a composite index of social connections, ascriptive traits sought by employers, and economic opportunity. A number of factors, including labor segment, age, schooling, and previous occupation determine the value of y*. For simplicity, we assume that the observed variables have additive, linear effects on the unobservable level of advantage. Thus

$$y^* = A = BED + \beta AGE + S, \qquad (4)$$

where

$$A = A(OC, SEG)$$

$$B = B(SEG)$$

$$X = \beta(SEG).$$

The intercept (A) and the ED and AGE coefficients (B, β) vary with initial occupation and labor segment. Further, certain differentials are assumed to be zero in accordance with equation (3). Thus, for example, the ED and AGE coefficients are the same across the labor segments with the exception of black males in the periphery.[14] Let the dichotomous random variable UP denote upward mobility: if a worker has a sufficiently high level of advantage, then changing occupation will result in upward mobility. That is,

$$UP = 100 \text{ if } y^* \geq y' \qquad (5a)$$

$$UP = 0 \text{ if } y^* < y' \qquad (5b)$$

where y' is a level of advantage required to produce upward mobility.

A bell-shaped distribution for the stochastic term in (4) implies that the logit L, which is the log of the odds favoring upward mobility, is approximately a linear function of the determinants of y*.[15]

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[14] Using the notation of Appendix A, the dependent variable y* is an additive linear function of SEG6, FEMALE, BLACK, ED, AGE, EDxSEG6, AGExSEG6, D1, D21, and D22.

[15] To the extent that the level of advantage y* is the sum of many independent factors, then by the central limit theorem the distribution of the level of advantage will approximate the normal distribution. If y* is approximately normal then it will also be approximately logistic. If y* is logistic, then the logit of UP is a linear function of the determinants of y*. The same argument applies if y' is

$$L = \log \frac{PROBUP}{1-PROBUP} = A + BED + IAGE, \quad (6)$$

where

$$A = A(OC, SEG)$$

$$B = B(SEG)$$

$$I = I(SEG).$$

The logit model embodies an interesting form of interaction and nonlinearity. The effect of a variable is least for those workers who are otherwise exceptionally advantaged or exceptionally disadvantaged. For example, additional schooling is especially valuable if a worker's level of advantage y* is close to y', the level required to produce substantial upward mobility.

Table 4 presents the estimated coefficients for

[Table 4 about here.]

equation (6) along with the asymptotic standard errors. The estimates were obtained using an iterative maximum likelihood procedure. All coefficients, except the constant, are highly significant.

With the trivial exception of the constant term, the coefficient values have the same ordering for both models. Furthermore, the relative magnitudes of the coefficients are very similar. Under the linear probability model, the effect of gender is about twice the effect of race, whereas under the logit model the gender effect is one and two-thirds the racial effect. There are three estimated occupational coefficients. Under both models, the least opportune coefficient is about twice the size of the middle coefficient, and the most opportune is similar in size but opposite in sign to the middle coefficient. For both models, excluding black males in the periphery, the schooling effect is about five times the age effect. For both models, the schooling effect for black males in the periphery is about 40% the size of the effect for others, and the age effect is about twice what it is for others.

The mobility rate was calculated for each labor segment, using the logit estimates to adjust for segment differences in age, schooling, and initial occupational distribution. These adjusted mobility rates, which are displayed in Table 5, are similar to the adjusted mobility

[Table 5 about here.]

rates obtained with the linear probability model (Table 3). The two sets of new adjusted mobility rates are similar,

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also regarded as stochastic and the sum of many independent factors. (See Amemiya, 1975.)

though the logit estimates indicate a higher degree of advantage for white males and a slightly stronger sensitivity to changes in the independent variables.

IMPLICATIONS AND EXTENSIONS

Occupational Effects and SEI

Our analysis pays close attention to differences among the initial low-paid occupations. We estimated for each low-paid occupation an occupational effect on upward mobility, thereby determining the mobility advantage of each occupation relative to each other occupation. We found that operative and labor occupations generally have a mobility advantage relative to service occupations. The notion of an occupational effect, however, is not novel with our analysis.

An effect of occupations on mobility is implicit in the original Blau-Duncan model (Blau and Duncan, 1967) and in many, though not all, of the many subsequent path models of stratification. In the Blau-Duncan model, one equation specified that the socioeconomic status of current occupations is affected by the socioeconomic status of first occupation. This equation may be rewritten to state that change in socioeconomic status is affected by initial socioeconomic status. Socioeconomic status is measured by the Duncan SEI score, which assigns to each detailed occupation a point on a vertical continuum. The estimates for these models indicate that SEI of current occupation is positively related to SEI of first occupation.

An effect of occupation on mobility is explicit in the mobility studies of Leigh (1978) and Rosenfeld (1980). These studies employ the Duncan SEI index, explicitly relating change in SEI to prior SEI. The estimates produce a coefficient for prior SEI which is between 0 and -1, implying that SEI of initial occupation has a positive linear effect on SEI of current occupation.

Thus, the Blau-Duncan model and recent mobility models view occupational change as a process of moving up a ladder calibrated by the Duncan SEI index. The implication is that the probability a low-paid worker will move to a mainstream occupation is a positive function of the SEI score of initial occupation. Table 6 provides data to assess whether the occupational effects can be accounted for by the SEI index.

[Table 6 about here.]

The first column of Table 6 gives the SEI value for each of the low-paid occupations analyzed in this study.[16]

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[16] The SEI values are from Hauser and Featherman (1977: Appendix B).

The second column gives the estimated mobility advantages for each occupation, which are the occupational effect differentials estimated by the linear probability model. The rows of the table are ordered according to SEI. The lack of ordering to the mobility advantages reflects the weak association between SEI and mobility advantage. The linear correlation between SEI and mobility advantage is only 0.37, which is not significant at the 0.05 level.

The inadequacy of SEI in accounting for mobility advantage is illustrated by comparison of service occupations to operative and laborer occupations. Only the service occupations have negative values for mobility advantage, and the mean mobility advantage of service occupations is -8.7 as compared to a mean of 1.7 for operative and laborer occupations. Yet based on SEI we would expect the reverse pattern. The mean SEI for the service occupations is 13.3, which is 2.1 points higher than the mean SEI for the operative and laborer occupations.[17]

Opportune Destinations and Mobility Channels

To this point, the analysis has been concerned only with whether or not a worker moves into the mainstream stratum. Now let us distinguish among the mainstream occupations. Where are the opportunities for low-paid workers? Which mainstream occupations serve as openings out of the low-paid stratum--as doorways through which 'escape' is most possible?

A partial answer is to determine which occupations are mostly frequently entered by upwardly mobile workers. These occupations, the most common mainstream destinations, shall be referred to as opportune destinations.

Table 7 lists the mainstream occupations which are entered by at least 1.0% of the occupational changers. Five of these opportune destinations are operative categories: machine operatives (miscellaneous specified), assemblers, truck drivers, miscellaneous operatives, and checkers. Two are clerical: bookkeepers and secretaries. Two are managerial: managers (not elsewhere classified), and restaurant managers. And two are craft categories: foremen (not elsewhere classified), and auto mechanics. There are no professional, sales, service, or laborer occupations among the opportune destinations. Although only eleven in number, these opportune destinations account for nearly half (45.7%) of the upward mobility from the low-paid stratum to the mainstream.

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[17] This analysis, however, is not conclusive since the mainstream stratum is defined on the basis of median earnings of occupation. Strictly speaking, a test of the SEI model should be based on a boundary defined by SEI of occupation.

Considering that there are about 300 mainstream occupations, the concentration of about half of the upward mobility to just eleven occupations reflects a high degree of structure to the labor market. Knowing which are the opportune destinations may be useful not only to low-paid workers and career counselors, but also to social policy analysts. For example, the large number of operative occupations listed in Table 7 suggests that expansion of employment in the well-paid operative occupations is critical for increasing economic opportunity.

Perhaps more revealing of the structure of the labor market, however, are the specific pathways to the opportune destinations. As suggested by the coefficients of the mobility model (equations 3a, 3b), access to the various opportune destinations depends on prior occupation and labor segment. It is therefore useful to investigate separately, for each labor segment, the flow of workers from specific low-paid occupations to specific mainstream occupations.

A channel of upward mobility is defined by specifying, for a particular labor segment, a low-paid occupation and a mainstream occupation. The flow through the mobility channel is measured by the transition probability and the frequency for the channel. The transition probability is the proportion of occupational changers initially employed in the low-paid occupation who move to the mainstream occupation. The channel frequency is the number who move rather than the proportion. For example, the first row of Table 8 refers to the mobility channel between the garage workers occupation and truck drivers occupation for white males employed in the periphery. The channel frequency is 99, meaning that of the white males in the sample initially employed as garage workers in the periphery, 99 became truck drivers. The transition probability is 7.3%, which means that of the white male occupational changers who were initially employed as garage workers in the periphery, 7.3% became truck drivers.

Table 8 identifies and measures channels of upward mobility. The criteria for inclusion in the table are that the channel frequency be at least five, that the channel transition probability be at least 3.9%, and that the destination occupation be one of the eleven opportune destinations. There are 48 such channels of upward mobility. These channels are very unevenly distributed across the eight labor segments: 21 in the white male periphery, 6 in the white male core, 8 in the black male periphery, 1 in the black male core, 7 in the white female periphery, and 5 in the white female core. Although the mobility channels data in Table 8 ignores many of the mobility flows, it does help illuminate my earlier

findings.[18]

Table 8 suggests that much of the overall mobility advantage of white men is due to their greater access to foremen and managerial jobs. For white men there are six mobility channels to the foreman destination whereas there are no such channels for black men or women. Also, white men have relatively very high rates of mobility to the managerial categories. There are five white male channels to the occupation of truck drver, but there are also four such channels for black men. The upward mobility of white women is largely due to access to clerical destinations, namely bookkeeper or secretary, neither of which are opportune destinations for men. In addition, white women appear to hold their own in mobility into well-paid factory operative destinations and do about as well as black men in becoming managers.

Table 8 also illuminates the effects of initial occupation on mobility. The relatively strong position of garage workers is reflected in channels of mobility to several opportune destinations, namely truck drivers, auto mechanics, foremen, and one of the managerial categories. The general mobility disadvantage of service occupations is reflected in a lack of mobility channels to the categories of foremen and truck drivers.

SUMMARY AND CONCLUSION

From an individualistic perspective, the labor market serves to develop and utilize worker productivity. These virtues are often regarded to be a logical consequence of a competitive economy and thus demonstrable even without empirical evidence. For example: "In an important paper, Sherwin Rosen demonstrates that in acquiring labor market skills, workers pass through an optimal sequence of jobs" (Leigh, 1976a:132).

In contrast, this study relies on the concept of labor segment, which provides an antidote to the individualistic

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[18] The direct examination of mobility flows between narrowly defined occupations, conditional on labor segment, requires a very large data base. The data base used in this study is very large but is still smaller than ideal. Sample size is especially problematic for particular labor segments, such as black females in the core, and for particular initial occupations, such as produce graders. Another limitation is the failure to take into account the effects of age and schooling. Thus the analysis is not intended to be definitive but is meant to suggest hypotheses to be addressed by alternative methods and independent samples (cf., Spilerman, 1977).

perspective. Two broad segments, a low-paid and a mainstream stratum, are defined in order to operationalize mobility of the type that might lift a family or individual out of poverty. To permit investigation of effects due to race, gender, and industrial sector, the low-paid stratum is subdivided into eight labor segments. To further examine structural effects and to identify channels of mobility, the low-paid stratum is also subdivided into more narrowly defined occupational categories.

In its linear form, the mobility model specifies that for each labor segment the probability of upward mobility is the sum of three effects: age, years-of-schooling, and current occupation. The model allows for differences across the eight labor segments in the level of upward mobility as well as differences in the effects of age and schooling. The model is fit to prime-age occupational changers.

The estimates indicate that the chances for upward mobility differ across low-paid occupations. In addition, there are large effects for race and gender, and a substantial effect of industrial sector on black males. The estimates are substantially reproduced using a logit model.

Preliminary examination of detailed mobility flows, made possible by the very large size of the data base, illuminates the operation of segmentation factors. Mobility out of the low-paid stratum consists largely of mobility to better paid manual occupations -- particularly important for white men is the foreman category. The truck drivers category is important for black men, and well-paid factory operative jobs are important regardless of race and gender. Access to the categories of truck driver and foreman is improved by working as an operative or laborer rather than as a service worker. There is also a significant amount of mobility into some nonmanual occupations. For white women this mobility is primarily to the categories of secretary or bookkeeper. White men dominate the mobility flows into the managerial categories.

The results support the segmentation view of the labor market. A person's life chances are influenced by factors other than his or her productive potential. Socioeconomic inequality is exacerbated because gender, race, industry, and occupation are determinants of mobility.

APPENDIX: PARAMETER ESTIMATES

The following model was fit to data on individual workers:

$$PROBUP = A_1 + B_1 ED + \gamma_1 AGE + R_j A_j SEG_j + R_k D_k D_k + R_j B_j EDxSEG_j + R_j \gamma_j AGExSEG_j + S .$$

The model may be written:

$$PROBUP = A + BED + \gamma AGE + S$$

where

$$A = A_1 + R_j A_j SEG_j + R_k D_k D_k$$

$$B = B_1 + R_j B_j SEG_j$$

$$\gamma = \gamma_1 + R_j \gamma_j SEG_j .$$

PROBUP is the probability of substantial upward occupational mobility. ED is years of schooling, and AGE is years of age. (See section 2 for precise definitions.) The SEGj and Dk are dummy variables. (See Table A1 for definitions.) The SEGj variables refer to labor segments. All coefficients are differentials except for A1, B1, and γ_1.

The Dk variables are used to measure occupational effects on the level of upward mobility. Fifteen of the Dj variables represent particular three-digit occupations. D8 indicates whether the worker's occupation is one of the ten service occupations. There are 136 groups defined by the intersections of labor segment and initial occupation (8x17 = 136). Three of these groups are exceptionally populous and for these three groups separate dummy variables are defined: D2 designates white male garage workers in the periphery; D13 designates white female waitresses in the periphery; and D19 designates black female domestic workers.

The model was fit by ordinary least squares using stepwise backward elimination. On successive steps differentials found not to be significant were eliminated. The final model required the estimation of only 11 coefficients. The computational results for each step are displayed in Tables A2 and A3.

The first step entails estimation of all 43 coefficients. On the first step, A1, B1, and γ_1 refer to white males in the core sector, and the other A, B, γ coefficients are differentials relative to white males in

the core. Nine of these differentials are less than their standard errors. D1, D3,..., D7 are differentials among nonservice occupations, relative to stockhandlers, in the levels of upward mobility. Four of these differentials are less than their standard errors. Four of the differentials among service occupations, which are relative to cleaners, are less than their standard error. Finally, the white male garage worker differential is less than its standard error.

The second step is to reestimate the model after eliminating the 18 differentials mentioned above. Thus we drop nine independent variables defined by the product of a SEGj variable with either ED or AGE, and nine of the occupational effects variables (D2, D3, D4, D6, D7, D11, D12, D14, D16).

In examining the results of step two, we apply a more stringent test of whether a differential is large enough to be retained: Is the differential significant at the conventional 0.05 level? Using this criterion, three more differentials are not significant: the differential for gardeners, the effect of age for white males in the periphery, and the effect of age for white females in the periphery. Thus, there is only one significant occupational differential among the nonservice occupations, and the effects of AGE and ED are significantly different only for black males in the periphery.

In addition to eliminating the three differentials mentioned above (drop D5, the product of AGE and SEG5, and the product of AGE and SEG7), step 3 entails redefining the remaining differentials. The redefinition of the differentials produces an observationally equivalent model that is more convenient for testing additional simplifying assumptions. The redefinition involves both the β_j coefficients and the D_j coefficients.

The β_j parameters reflect differences across labor segments in the level of upward mobility. Corresponding to those eight parameters is a constant and seven SEGj dummy variables. We now replace the constant and the SEGj variables with two dummy variables for each of the four race-gender categories. The first of the two indicates whether a worker belongs to the particular race-gender category (WM, BM, WF, or BF), and the second indicates whether the worker belongs to the particular race-gender category and is employed in the periphery. The coefficient on the second of these two variables represents a core/periphery differential.

The results from step two included nine significant D coefficients which captured occupational effects. Corresponding to these D coefficients are nine Dk variables. In step three we keep unchanged six of these variables (D1, D13, D10, D15, D17, D19), and we replace three variables (D8, D9, D18) with new variables (D20, D21, D22) which are related to the replaced variables. D20 designates whether a worker is a cook, an attendant, a crossing guard, or a white

female waitress in the periphery (sum of D9, D13, D15, D16). D21 indicates whether a worker is a dishwasher or a household servant, but not black female (sum of D16 and D18, less D19). D22 indicates whether a worker is a service worker other than one designated by D20 or D21. (D21 may be found by subtracting D20 and D21 from D8.)

The results of step three indicate that eight differentials are not statistically significant. The core/periphery differential in level of mobility is significant only for black males. The coefficients for occupational effects are not significant for the differentials relative to the aggregates defined by D20, D21, and D22.

Step four drops independent variables corresponding to the eight not significant differentials (SEG5, SEG7, SEG8, D10, D13, D15, D17, D19). In addition, we redefine variables in order to test whether the segment effects can be captured by additive race and gender effects. Thus we replace the variables WM, BM, and WF with the variables FEMALE and BLACK, and reintroduce a constant term.

The results of step four indicate that two of the coefficients are not significant. The effect of being a black female on the level of upward mobility is captured by adding together the race and gender effects. The coefficient on D20 is not statistically significant.

The fifth step is to reestimate the model after eliminating the two not significant differentials produced by the previous step. All the coefficients calculated in step five are very highly significant.

Table A1. Definitions of Dummy Variables

Variable	Definition
SEG2	Black males in core
SEG3	White females in core
SEG4	Black females in core
SEG5	White males in periphery
SEG6	Black males in periphery
SEG7	White females in periphery
SEG8	Black females in periphery
D1	Garage Workers
D2	D1 x SEG5
D3	Produce graders
D4	Carpenters' helpers
D5	Gardeners
D6	Lumberworkers
D7	Vehicle washers
D8	Service workers
D9	Cooks
D10	Dishwashers
D11	Fountain workers
D12	Waiters and waitresses
D13	D12 x SEG7
D14	Food service workers
D15	Attendants
D16	Porters
D17	Crossing guards
D18	Household servants
D19	D18 x SEG8

Notes: D2, D13, and D18 are products of dummy variables and denote intersections of a labor segment with a three-digit occupation; e.g., D2 denotes white male garage workers in the periphery. D8 is an aggregate denoting the union of all three-digit service occupations. The other D variables denote three-digit occupations. One service occupation and one nonservice occupation do not have corresponding dummy variables: stockhandlers and cleaners.

Table A2. Parameter Estimates: Steps 1 and 2.

Variable	Step 1 Estimate	Step 1 Standard Error	Step 2 Estimate	Step 2 Standard Error
Constant	69.7	10.9	64.6	5.3
ED	2.35	0.48	2.44	0.13
AGE	-0.74	0.20	-0.63	0.11
SEG2	-14.3	22.9	-11.7	2.8
EDxSEG2	-0.11	0.94	--	--
AGExSEG2	0.09	0.41	--	--
SEG3	-38.0	15.1	-23.4	1.9
EDxSEG3	0.39	0.68	--	--
AGExSEG3	0.23	0.27	--	--
SEG4	-25.8	20.1	-36.4	2.5
EDxSEG4	-0.69	0.90	--	--
AGExSEG4	-0.05	0.36	--	--
SEG5	-22.6	12.0	-12.3	6.4
EDxSEG5	0.40	0.53	--	--
AGExSEG5	0.38	0.23	0.25	0.15
SEG6	15.1	15.2	20.7	11.8
EDxSEG6	-1.20	0.64	-1.30	0.44
AGExSEG6	-0.42	0.29	-0.53	0.23
SEG7	-35.0	12.1	-31.4	6.4
EDxSEG7	-0.04	0.54	--	--
AGExSEG7	0.26	0.22	0.16	0.14
SEG8	-46.2	13.3	-45.6	7.3
EDxSEG8	-0.26	0.58	--	--
AGExSEG8	0.28	0.24	0.20	0.17
D1	11.1	3.3	10.8	1.5
D2	0.17	3.4	--	--
D3	4.1	0.8	--	--
D4	1.2	4.1	--	--
D5	-2.6	2.1	-3.1	1.8
D6	1.2	2.2	--	--
D7	0.1	3.0	--	--
D8	-12.7	1.9	-12.8	1.2
D9	10.0	1.6	9.7	1.1
D10	-8.3	2.8	-8.8	2.6
D11	1.0	2.4	--	--
D12	1.9	2.2	--	--
D13	9.6	2.2	11.2	1.4
D14	-0.5	1.9	--	--
D15	9.5	3.4	8.6	3.2
D16	-1.2	5.2	--	--
D17	17.0	4.1	16.8	3.9
D18	-8.5	2.5	-8.6	2.1
D19	10.5	2.7	10.2	2.7

Table A3. Parameter Estimates: Steps 3, 4, 5.

Variable	Step 3 Estimate	Step 3 Std. Error	Step 4 Estimate	Step 4 Std. Error	Step 5 Estimate	Step 5 Std. Error
Constant	--	--	55.7	2.9	55.1	2.9
White males, WM	56.9	3.2	--	--	--	--
Black males, BM	45.4	3.7	--	--	--	--
White females, WF	33.4	3.4	--	--	--	--
Black females, BF	20.7	3.6	-2.0	2.6	--	--
SEG5	-1.6	1.6	--	--	--	--
SEG6	39.5	11.2	39.6	11.2	41.5	11.0
SEG7	-0.9	1.5	--	--	--	--
SEG8	-0.7	2.4	--	--	--	--
FEMALE	--	--	-22.5	1.0	-23.6	0.8
BLACK	--	--	-10.3	2.4	-11.8	1.0
ED	2.44	0.13	2.44	0.13	2.43	0.13
AGE	-0.47	0.05	-0.47	0.05	-0.47	0.05
EDxSEG6	-1.31	0.44	-1.32	0.44	-1.36	0.44
AGExSEG6	-0.69	0.21	-0.69	0.21	-0.69	0.21
D1	11.5	1.4	11.3	1.4	12.0	1.3
D10	-.04	3.1	--	--	--	--
D13	1.5	1.4	--	--	--	--
D15	-1.1	3.2	--	--	--	--
D17	7.2	4.0	--	--	--	--
D19	1.5	1.8	--	--	--	--
D20	-2.5	1.2	-2.1	1.1	--	--
D21	-20.9	2.2	-21.3	1.7	-19.9	1.6
D22	-12.1	1.2	-12.0	1.1	-10.7	0.9

Notes: WM = 1 - SEG2 - SEG3 - SEG4 - SEG6 - SEG7 - SEG8. BM = SEG2 + SEG6. WF = SEG3 + SEG7. BF = SEG4 + SEG8. FEMALE = SEG3 + SEG4 + SEG7 + SEG8. BLACK = SEG2 + SEG4 + SEG6 + SEG8. D30 = D9 + D13 + D15 + D17. D21 = D10 + D18 - D19.

TABLES

Table 1. Occupational Distribution of Workers in Low-Paid Stratum, by Labor Segment

A. Periphery Industrial Sector

Initial Occupation	White Males	Black Males	White Females	Black Females
Garage Workers (623)	1356	151	34	4
Produce Graders (625)	5	0	9	0
Carpenters' Helpers (750)	12	2	1	0
Gardeners (755)	435	77	16	1
Lumberworkers (761)	483	132	10	2
Stockhandlers (762)	626	82	466	53
Vehicle Washers (764)	92	85	14	10
Cleaners (902)	163	133	121	111
Cooks (912)	686	165	816	330
Dishwashers (913)	104	43	78	55
Fountain Workers (914)	59	9	218	58
Waiters and Waitresses (915)	242	82	3463	304
Food Service Workers, n.e.c. (916)	167	45	294	116
Personal Attendants (933)	49	10	60	10
Porters (934)	38	18	3	0
Crossing Guards (960)	2	0	4	3
Household Servants (984)	35	64	510	1862
Total	4554	1098	6117	2919

B. Core Industrial Sector

Initial Occupation	White Males	Black Males	White Females	Black Females
Garage Workers (623)	42	15	2	0
Produce Graders (625)	35	5	80	9
Carpenters' Helpers (750)	102	30	1	0
Gardeners (755)	202	32	12	1
Lumberworkers (761)	15	3	1	0
Stockhandlers (762)	173	27	53	10
Vehicle Washers (764)	58	20	2	4
Cleaners (902)	122	117	193	202
Cooks (912)	68	50	517	148
Dishwashers (913)	20	7	30	5
Fountain Workers (914)	5	2	160	28
Waiters and Waitresses (915)	24	17	99	29
Food Service Workers, n.e.c. (916)	56	26	448	111
Personal Attendants (933)	19	9	48	9
Porters (934)	12	12	1	0
Crossing Guards (960)	27	3	87	14
Household Servants (984)	0	0	0	0
Total	980	375	1734	570

Notes: The low-paid stratum consists of the 17 low-paid occupations listed in Table 1. Workers in the low-paid stratum are divided into eight labor segments on the basis of industrial sector, gender, and race.

Sample is restricted to persons aged 26-49 in 1965 who were in the experienced civilian labor force in 1965 and 1970, who changed occupation between 1965 and 1970, and who were employed in one of the 17 low-paid occupations in 1965. Sample size is 18,347.

Source: the three one-in-a-hundred Public Use Samples of the 1970 Census (U.S. Bureau of the Census, 1972). The numbers in parenthesis are census three-digit occupational codes.

Table 2. Descriptive Univariate Statistics for Workers in Low-Paid Stratum, by Labor Segment

Labor Segment	N	Mean UP	ED Mean	ED Std. Dev.	AGE Mean	AGE Std. Dev.
White Males in Core	980	63.8	12.0	3.09	41.8	7.10
Black Males in Core	375	47.7	11.5	3.06	41.9	6.87
White Females in Core	1734	35.4	12.5	2.26	45.0	6.24
Black Females in Core	570	21.2	11.9	2.54	42.3	6.61
White Males in Periphery	4554	66.1	12.1	3.06	40.9	7.01
Black Males in Periphery	1098	45.9	11.0	3.40	40.8	6.99
White Females in Periphery	6117	38.3	12.3	2.35	42.9	6.73
Black Females in Periphery	2919	18.4	11.4	2.64	41.7	6.68
Total	18347					

Table 3. Adjusted Mobility Rates by Labor Segment

Labor Segment	Mean ED, Mean AGE	Low ED, Low AGE	High ED, High AGE
White Males in Core	61.7	57.3	66.4
Black Males in Core	49.9	45.5	54.6
White Females in Core	38.1	33.7	42.8
Black Females in Core	26.3	21.9	31.0
White Males in Periphery	61.7	57.3	66.4
Black Males in Periphery	44.1	52.8	35.8
White Females in Periphery	38.1	33.7	42.8
Black Females in Periphery	26.3	21.9	31.0

Notes: Mean ED=12.00, Mean AGE=42.19, Low ED=8, Low AGE=31, High ED=16, High AGE=53.

Table 4. Parameter Estimates for Logit Model

Variable	Estimate	Standard Error
Constant	0.115	0.143
FEMALE	-1.04	0.04
BLACK	-0.624	0.051
ED	0.125	0.007
AGE	-0.0231	0.0025
D1	0.571	0.067
D21	-0.994	0.0846
D22	-0.496	0.0417
SEG6	1.987	0.508
EDxSEG6	-0.0779	0.205
AGExSEG6	-0.0267	0.0098

Note: See Table A1 for definitions of dummy variables.

Table 5. Adjusted Mobility Rates by Labor Segment, Logit Model

Labor Segment	Mean ED, Mean AGE	Low ED, Low AGE	High ED, High AGE
White Males in Core	61.9	56.0	67.6
Black Males in Core	46.5	40.6	52.8
White Females in Core	36.5	31.1	42.4
Black Females in Core	23.5	19.5	28.3
White Males in Periphery	61.9	56.0	67.6
Black Males in Periphery	44.6	53.8	36.2
White Females in Periphery	36.5	31.1	42.4
Black Females in Periphery	23.5	19.5	28.3

Table 6. SEI and Mobility Advantage of Low-Paid Occupations

Occupation	SEI	Mobility Advantage
Personal Attendants (933)	26.3	0
Crossing Guards (960)	17.9	0
Garage Workers (623)	17.9	12.0
Fountain Workers (914)	17.0	-10.7
Stock Handlers (762)	16.7	0
Waiters and Waitresses (916):		
White Females in Periphery	16.0	0
Others	16.0	-10.7
Cooks (912)	15.0	0
Produce Graders (625)	12.2	0
Dishwashers (913)	11.0	-19.9
Food Service Workers (916)	11.0	-10.7
Gardeners (755)	10.9	0
Vehicle Washers (764)	8.6	0
Porters (934)	7.8	-10.7
Cleaners (902)	7.8	-10.7
Carpenters' Helpers (750)	7.2	0
Household Servants (984):		
Black Females	7.0	-10.7
Others	7.0	-19.9
Lumberworkers (761)	4.1	0

Table 7. Most Common Occupational Destinations of Low-Paid Workers Who Move Into Mainstream

Occupation	Percent
Managers, nec (245)	3.39
Restaurant managers (230)	3.10
Machine operatives, misc. specified (690)	2.12
Assemblers (602)	2.18
Truck drivers (715)	1.87
Bookkeepers (305)	1.33
Foremen, nec (441)	1.29
Miscellaneous operatives (694)	1.25
Checkers (610)	1.12
Secretaries (372)	1.10
Auto mechanics (473)	1.07

Note: Percent is the percentage of occupational changers who have the specified occupation as their destination occupation.

Table 8. Channels of Upward Mobility by Labor Segment

Initial Occupation	Labor Seg	Destination Occupation	P
Garage Workers (623)	WMP	Truck Drivers (715)	7.30
	WMP	Auto Mechanics (473)	8.19
	WMP	Manager , nec (245)	14.97
	BMP	Managers, nec (245)	6.62
	BMP	Auto Mechanics (473)	9.27
	BMP	Truck Drivers (715)	7.95
	WMC	Foremen, nec (441)	11.90
Produce Graders (625)	WFC	Machine Op's,misc spec(690)	8.75
Carpenters' Helpers (750)	WMC	Truck Drivers (715)	4.90
Gardeners (755)	WMP	Truck Drivers (715)	5.75
	WMP	Foremen, nec (441)	6.90
	WMC	Foremen, nec (441)	5.45
	WMC	Truck Drivers (715)	9.90
Lumberworkers (761)	WMP	Managers, nec (245)	5.80
	WMP	Truck Drivers (715)	8.07
	WMP	Machine Op's,misc spec(690)	4.14
	WMP	Foremen, nec (441)	4.35
	BMP	Truck Drivers (715)	11.36
Stock Handlers (762)	WMP	Managers, nec (245)	16.93
	BMP	Managers, nec (245)	9.76
	WFP	Managers, nec (245)	4.08
	WFP	Bookkeepers (305)	4.94
	WMC	Foremen, nec (441)	6.94
Vehicle Washers (764)	BMP	Machine Op's,misc spec(690)	5.88
	WMC	Machine Op's,misc spec(690)	8.62
Cleaners (902)	WMP	Managers, nec (245)	4.29
	WMP	Truck Drivers (715)	4.29
	WMP	Foremen, nec (441)	4.91
	BMP	Truck Drivers (715)	4.51
	BMC	Truck Drivers (715)	5.98
	WFC	Assemblers (602)	4.15
Cooks (912)	WMP	Managers, nec (245)	3.94
	WMP	Restaurant Managers (230)	22.01
	BMP	Machine Op's,misc spec(690)	4.85
	WFP	Restaurant managers (230)	6.00
	WFC	Restaurant Managers (230)	7.35
Dishwashers (913)	WFP	Misc Operatives (694)	6.41
Fountain Workers (914)	WMP	Restaurant Managers (230)	16.95
	WFP	Restaurant Managers (230)	5.50
Waiters, Waitresses (915)	WMP	Managers, nec (245)	4.13
	WMP	Restaurant Managers (230)	11.98
	WFP	Restaurant Managers (230)	4.97
	WFC	Machine Op's,misc spec(690)	5.05
	WFC	Secretaries (372)	7.07
Food Service Workers(916)	WMP	Restaurant Managers (230)	6.59
	WMP	Managers, nec (245)	10.78
	WMP	Machine Op's,misc spec(690)	4.19
Personal Attendants (933)	WFP	Secretaries (372)	13.33

Notes: P=Transition probability of mobility channel. N=Frequency of mobility channel. For identifying initial labor segment (Labor Seg), W=white, B=black, F=female, M=male, P=periphery, and C=core. Restricted to destinations listed in Table 7 for which P > 3.9 and N > 4.

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