BLACK-WHITE DIFFERENCES IN SOCIAL MOBILITY IN THE PAST 30 YEARS

MUITINOMIAL LOGIT LATENT-CLASS REGRESSION MODELS

Kazuo Yamaguchi

The University of Chicago

February, 2003

ABSTRACT

This paper introduces multinomial logit latent-class regression models for racial comparisons of intergenerational occupational mobility. Four latent classes, which are labeled as the "stable upper (SU)" class, the "downwardly mobile (DM)" class, the "upwardly mobile (UM)" class, and the "stable lower (SL)" class, are identified. Compared with blacks, whites are shown to be disadvantaged in mobility chances in three distinct respects. The greatest disadvantage for blacks compared with whites comes from poorer status background, and is characterized by much smaller odds of being in the SU and DM classes versus the UM and SL classes. The second strong disadvantage is a smaller chance of experiencing upward mobility, controlling for education, among those with relatively low status background. This is characterized by smaller odds of being in the UM class versus the SL class for blacks than for whites. The third disadvantage is a greater probability of experiencing downward mobility, controlling for education, among those with relatively high status background. This is characterized larger odds of being in the DM class versus the SU class for blacks than for whites. Changes over time in these three elements of racial inequality in mobility chances are also described.

BLACK-WHITE DIFFERENCES IN SOCIAL MOBILITY IN THE PAST 30 YEARS MUITINOMIAL LOGIT LATENT-CLASS REGRESSION MODELS

The central concern in the studies of social mobility has been cross-national differences or temporal change in the openness of the society measured by the extent to which sons' occupations depend on their fathers' occupations: the society is open to the extent that one's own class situation depends less on their ascriptive class membership. Since the time of 1970's, the analytical tool that was employed to address this issue by most researchers was loglinear models because the models assess the dependence of sons' occupations on fathers' occupations controlling for change in occupational distribution over a generation. The recognition of a theoretical necessity to distinguish between structural mobility caused by change in the occupational distribution over a generation, and circulation (or exchange) mobility that represents the extent of dependence of sons' occupation on fathers' occupation -- and attempts to measure the openness of the society independent of change in occupational distribution over a generation -- exited before the advent of loglinear models (Yasuda 1964), and loglinear models were employed as a result of scholars' recognition that they are ideal analytical tools in making this distinction (Sobel et. al. 1985; Hauser and Grusky 1988) -- while a recent study pointed out a limitation of this distinction by standard loglinear models (Sobel et. al. 1998). Studies by Hauser, Featherman, and their associates (Hauser and Featherman 1977; Featherman and Hauser 1978) based on the analysis of Occupational Change in a Generation Surveys I and II (hereafter OCG-I and OCG-II) were landmarks of social stratification research that extensively employed loglinear models for social mobility analyses. Many subsequent studies by Duncan (1979), Hauser (1979, 1984), Brieger (1981), Hout (1983, 1984a, 1984b, 1988), Yamaguchi (1983, 1986), Sobel et al. (1985), Grusky and Hauser (1985; Hauser and Grusky

(1988)), Wang (1990, 1992), Xie (1992), and Goodman and Hout (1998) among others, employed loglinear models of increasing sophistication to characterize differences in *mobility patterns* and informed us of the empirical characteristics of this particular social phenomenon.

While social mobility studies are thus comparative in nature from its onset regarding comparison across nations or over time, there has been a curious relative absence of comparative social mobility studies that focus on differences in social mobility patterns among groups in a single society, especially among racial/ethnic groups.

The analysis of mobility differences among these intrasocietal groups, however, is important and informative in understanding inequality in social opportunity in the society. Before the time of using loglinear models, Duncan (1968) reported, based on data from the OCG-I that the mobility pattern for African Americans (blacks hereafter) was conspicuous in that regardless of their occupational origins, the majority of blacks found themselves in semi-skilled and unskilled occupations. This finding implied two things. First, among blacks being a black rather than one's ascriptive occupational class membership largely determined one's occupational class destination. Second, as a result, blacks with various class origins had pervert equality of opportunity among themselves, that is, their class destinations depended much less on their class origins than whites' class destinations did. One thing is clear from this observation. The analysis based on loglinear models that assess social mobility by controlling for the distribution of occupational destinations is not suitable for comparing inequality in occupational opportunity between blacks and whites: Differences between blacks and whites in the distribution of occupational destinations is the core element of racial inequality in social opportunity and is not something that should to be controlled out. As a result of this recognition, researchers in social stratification who compare racial/ethnic differences in social opportunity typically employed regression models for the attainment

of occupation as in the comparison of the attainment of education and income among groups. In the study of occupational attainment, however, mobility is simply reduced to a regression coefficient for the effect of father's socioeconomic status on son's socioeconomic status, and the racial difference in mobility is reduced to the main race effect and interaction effect of race and father's socioeconomic status on status attainment. An analysis of social-mobility patterns, however, can provide richer information than a characterization of mobility by such regression coefficients for several reasons. First, it can distinguish between immobility represented by the tendency to remain in the same status category as father's, and the association of father's and son's statuses among people which change their statuses over a generation, as two distinct mechanisms that generate the dependence of son's status on father's status. Second, it can distinguish between the tendency for some people with relatively low status origins to experience upward mobility and the tendency for some people with relatively high status origins to experience downward social mobility as two analytically distinct aspects of social fluidity, while the correlation measure employed in the status attainment research cannot distinguish between the two. Third, the use of occupational categories rather than a unidimensional socioeconomic status characterization of occupation can also reveal more than one dimensions of occupational mobility (Hout 1984a; Yamaguchi 1983). Fourth, the categorical expression for occupation often provides a more concrete characterization of inequality in occupational opportunity, and also permits a handing of missing information on occupational origin in a simple and reasonable manner, as demonstrated in this paper.

An important study that employed loglinear models for the racial comparison of occupational mobility exists, however. It is a study by Hout (1984a). Hout pointed out a contradiction between Duncan's (1968)'s finding on race as the major determinant of blacks' occupational opportunity and Wilson's (1978) theory on the declining significance

of race and the increasing significance of class situations among blacks, analyzed the OCG-I (conducted in 1962) and OCG-II (conducted in 1973) data, and found that although the situation was contradictory to Wilson's theory in 1962 in that being a black rather than class background largely determined blacks' occupational opportunity, it is more consistent with Wilson's theory in 1973 because son's occupational status became more dependent on the occupational origin among blacks in 1973. Hout's loglinear analysis, which paid no attention to racial differences in the distribution of occupational destination, and only assessed whether the pattern and extent of dependence of son's occupation on father's occupation differs between blacks and whites, was adequate in addressing the issue he was concerned with, that is, whether class background matters for blacks as much as for whites. However, there was a curious absence of insight, in his study of racial differences in occupational mobility, into how such change in mobility patterns among blacks from 1962 to 1973 contributed to increase in the equality of occupational attainment between blacks and whites. That absence existed because the loglinear analysis separated mobility analysis from the analysis of occupational attainment. However, such a separation is undesirable in racial comparison of social mobility if a researcher wishes to relate an analysis of racial differences in mobility to an analysis of racial inequality in occupational opportunity.

Comparative studies of social mobility between men and women took a different rout. Most researchers in fact emphasized from the 1970s the importance of employing analytical models that control for marginal distributions, and as a result they favored loglinear analyses, or the related Stephen-Deming method for controlling for marginal distributions prior to the popularization of loglinear models, over other methods in comparing mobility patterns between man and women (Tyree and Trees 1974; Chase 1975; Featherman, Hauser, and Hogan 1977; Stevens and Boyd 1980; Hout 1998; Aschaffenberg 1995; Hong and Singlemann 1998). The theoretical justification for such

analyses, is that men and women in a single society do not compete in the same labor markets, as men in different societies do not, and therefore it is wrong to confound differences in the occupational destinations between men and women with differences in association between occupational origins and destinations in identifying gender differences in social mobility patterns. A consequence of this theoretical position was a detachment of mobility analysis from the analysis of gender inequality of occupational opportunity. I consider that the theoretical position that men and women do not compete in the same labor markets has become increasingly more difficult to justify as the proportion of labor-force participation by married women increased steadily.

The present paper introduces a new social-mobility model that takes into account both differences in the distribution of occupational destinations and differences in the pattern of association between occupational origins and destinations in some substantively meaningful ways so that such a model enriches the comparative study of social mobility and inequality of social opportunity among groups in a society. Such attempts were also made by Logan (1983) and Diprete (1990) who considered constrained multinomial logit models for a categorical occupational outcome, including a variable for occupational origin as a predictor to assess mobility effects. This paper presents an alternative approach to intrasocietal grovup comparison of social mobility based on multinomial latent-class regression models (Yamaguchi 2000), and assess, using the data of 1972-2000 General Social Surveys, the pattern and extent of racial differences in social mobility and change therein over time, and, at the same time, assess how they are related to racial inequality in occupational attainment and its change in the past 30 years.

SOCIAL CLASS AND LATENT MOBILITY CLASS

The latent class of mobility introduced in this paper represents a particular theoretical position in understanding class based on mobility situations. Wax Weber (1978 [1922]) was the first scholar who introduced a class notion, namely social class, based on social mobility situation. According to him, social classes are a discrete societal division and a reflection of multiplicity of class situations including commodity and labor markets, and are characterized by the within-group homogeneity of generational and individual mobility. In particular, Weber identified four social classes, namely, the class privileged through property ownership and education, propertyless intelligentsia and specialists, petty bourgeoisie, and the working class as a whole who possess neither property nor education. Hence, Weber identified human and physical capital as the two axes of social classes that determine mobility chances. Breiger (1981) attempted to apply the Weberian notion of social class to an analysis of standard two-way mobility table to identify a set of occupational categories that have *internal homogeneity* of mobility. Marsden (1985) also considered a generalization of Breiger's idea by using constrained latent-class models of social mobility. What is common between Brieger and Marsden, however, is that each social class (1) consists of a set of occupations and (2) has internal homogeneity in mobility pattern found in the two-way mobility table, which cross-classifies son's occupation with father's occupation, or individual occupation at two different points in time. While the homogeneity of mobility chances is the common basis of conceptualizing social class between Weber and Breiger/Marsden, Weber apparently considered human and physical capital rather than occupation as the basis of social class. While it is possible to reflect property ownership in defining occupational categories of social mobility, as is typically represented by studies of "class mobility" by Erikson and Goldthorpe 1992), the lack of considering education in conceptualizing social class by Breiger and Marsden seems to indicate an undesirable deviation from the original Weberian notion because we can expect that mobility chances depend heavily

on the *combination of class background and education* for intergenerational mobility. In particular, among people who have relatively low class background, we can expect those who have higher educational attainment than others to be more likely than others to experience upward mobility, and similarly, among people who have relatively high class background, we can expect those who have lower educational attainment than others to be more likely than others to experience downward mobility. The latent-class model I introduce in this paper attempts to identify groups of people whose mobility pattern, in terms of the distribution of occupational origins and destinations, is internally homogeneous, and at the same time, depends on education.

Latent-class models of social mobility were originally introduced by Clogg (1981). He found that for off-diagonal mobility data for persons whose occupational statuses differ from those of their fathers', a latent class model that hypothesizes two latent classes fitted the data quite well. He found that one latent class had consistently higher status origins and destinations than the other latent class. In other words, his model showed that the observed mobility structure can be expressed by a mixture of two latent classes, one of which tends to maintain high statuses over a generation and the other tends to maintain low statuses over a generation. This finding, while such a model may not be statistically rejected for its application to a two-way mobility table, is inconsistent with the expectation that people with status inconsistency between class background and own educational attainment experience upward mobility or downward mobility not by chance. Instead, we can expect that there will be at least four latent mobility classes, rather than two, namely "the stable upper class," "the stable lower class," "the upwardly mobile class," and "the downwardly mobile class," within each of which internal homogeneity of mobility exists. Indeed, when we apply the model that hypothesizes two latent classes to a three-way table that cross-classifies the mobility table with subject's education, the model attains a much worse fit than the specific four-class model that

reflects the above-described characterization of the classes, as demonstrated in this paper.

It is noteworthy that assuming four latent classes does not necessarily imply that each person in the population will be classified into one of these four classes. Instead, the latent class model assumes that the mobility pattern will be expressed as a linear probability mixture of these four latent-class patterns for each group having a distinct combination of status origin and status destination. The pattern of mixture may depend also individual attributes such as education and race that are included in the model. The model also assumes, when it is applied to off-diagonal elements of the mobility table, that the association of occupational origins and destinations are explained as the result of unobserved population heterogeneity in mobility chances and there is no direct association between origins and destinations except for diagonal immobility effects, once the unobserved heterogeneity, represented by the distinction of four latent classes, is taken into account.

There are thus conceptual similarities and differences between Weber's social class and latent mobility classes to be identified from the model introduced in this paper. The major similarity is that both are characterized by the internal homogeneity of mobility chances and at the same time reflects both education and class background. The major difference is that, social classes are observable social groups in the Weberian definition, while latent mobility classes are not directly observed but are indicated by observable class and education variables.

Racial differences in mobility pattern will then be characterized by the compositional differences of latent mobility classes between blacks and whites, and, similarly, historical change in racial differences in mobility will be characterized by racial differences in the compositional change in latent mobility classes over time. This is the basic theoretical and methodological approach of the present paper to mobility analysis.

THE SELECTION BIAS ISSUE OF MISSING DATA FOR CLASS ORIGIN AND A RELATED ISSUE OD CONCEPTUALIZING UNWARD/DOWNWARD MOBILITY

A very important specific methodological issue exists in racial comparison of social mobility in America. There has been a significant increase among black population in America in the proportion of people who are born out of wedlock (ref. to be added). One consequent of this is that the proportion of people for whom we cannot obtain the data of father's occupation is much higher for blacks than for whites, and such a tendency is more pronounced for more recent years. In our sample of 1972-2000 General Social Survey data, 31% of black men aged 20-69 have a missing father's occupation, while the proportion is 13% for whites. Hence, if we exclude those with missing father's occupation, we have a serious selection bias of not including socially handicapped people, and such selection bias will be greater for blacks than for whites, and even more so for recent years. Hence, we must include those with missing father's occupation in racial comparison of social mobility by treating "missing" as one of the categories of status origin.

Then, we face a question about how to define social mobility for those people. Technically, we define mobility in terms of the pattern of association of son's occupation on father's occupation, and the "missing category" does not become an issue in this respect. However, we try to characterize the extent to which people experience upward and downward mobility, and in this respect, the missing category raises an issue because we have no theoretical criterion to place this category in status hierarchy. The definition of downward and upward mobility, however, involves a more general issue. If social mobility reflects a multidimensional order, how should we characterize upward and downward mobility?

The model introduced in this paper assumes no unidimensional order among occupational categories. Instead, the model assumes, due to a technical necessity for

latent-class models described below, that we can identify the highest status category and the lowest status category among the set of occupational categories we distinguish. For a given pair of the highest and lowest statuses, the model further assumes, for the four latent mobility classes which refer to as the "stable upper (SU) class", "stable lower (SL) class," "downwardly mobile (DM) class," and "upwardly mobile (UM) class," that (1) only the SU and DM classes can have the highest status origin, (2) only the UM and SL classes can have the lowest status origin, (3) only the SU and UM classes can have the highest status destination, and (4) only the DM and SL classes can have the lowest status destination.

As a result of these four assumptions, the observed frequencies of mobility table correspond to the sum of one, two, or four latent classes as Table 1 illustrates it for the case of 9-by-8 cross-classification of status origins in the row and status destinations in the column. We assume here that the first category is the highest status category, the eighth category is the lowest status category, and the ninth origin category is the "missing" category.

Table 1. Correspondence between Four Latent Classes and Mobility Patterns[1]

	1	2	3	4	5	6	7	8
1	SU	SU+DM	SU+DM	SU+DM	SU+DM	SU+DM	SU+DM	DM
2	SU+UM	All four	All four	All four	All four	All four	All four	DM+SL
3	SU+UM	All four	All four	All four	All four	All four	All four	DM+SL
4	SU+UM	All four	All four	All four	All four	All four	All four	DM+SL
5	SU+UM	All four	All four	All four	All four	All four	All four	DM+SL
6	SU+UM	All four	All four	All four	All four	All four	All four	DM+SL
7	SU+UM	All four	All four	All four	All four	All four	All four	DM+SL
8	UM	UM+SL	UM+SL	UM+SL	UM+SL	UM+SL	UM+SL	SL
9	SU+UM	All four	All four	All four	All four	All four	All four	DM+SL

[1]Rows represent status origins, and columns represent status destinations;
Category 1 is the highest status category; Category 8 is the lowest status category;
Caterory 9 for the origin is the "missing" category.

Although these assumptions are sufficient to identify the four latent classes, they are also a technical necessity. Since we have only two indicators of latent classes, namely

father's occupation and son's occupation, we need some constraints on parameters to identify latent classes (Clogg 1981). The constraints to make the model's parameters identifiable become slightly more complicated for the four-class model, which is a special case of "two-factor" model (Magidson and Vermunt 2001). Although the constraints given above such that certain mobility cells correspond to one or two latent classes instead of four is not necessarily the only one that is needed, it certainly is the one which is consistent with the intended characterization of the four classes as the "stable upper", "downwardly mobile," "upwardly mobile," and "stable lower" classes.

In the model described below, we also assume, as long as the model fits the data well, the identify of the status-origin distribution between the SU and DM classes and between the UM and SL classes, so that the tendency to experience downward mobility (the tendency to be in the DM rather than the SU class) and the tendency to experience upward mobility (the tendency to be in the UM rather than the SL class) can be defined *independently of the occupational origin.* Hence, we characterize racial differences in occupational life chances to reflect three different factors: (1) those due to racial differences in the distribution of occupational origin (that is, the racial differences in the odds of being in the stable upper or downwardly mobile classes rather than the upwardly mobile or the stable lower classes), (2) those due to racial differences in the likelihood of not experiencing downward mobility among people who have relatively high status origins (that is, racial differences in the odds of being in the stable upper class rather than the downwardly mobile class), and (3) those due to racial differences in the likelihood of experiencing upward mobility among people who have relatively low status origins (that is, racial differences in the odds of being in the upwardly mobile class rather than the stable lower class).

The application focuses not only on how these three elements of mobility chances differ between blacks and whites, but also on how the differences changed in the past 30 years.

MODELS

Although the model introduced here assumes four latent mobility classes (SU, DM, UM, and SL classes), they are characterized by three latent variables L1, L2, and L3. Variable L1 distinguishes the group of SU and DM classes from the group of UM and SL classes, and variable L2 distinguishes the SU from the UM class, and variable L3 distinguishes the DM from the SL class, as shown in Table 2, which shows the design matrix of the three contrasts among the four latent-class categories.

Table 2. Design Matrix for Multinomial Contrasts for Four Latent Classes

	L1	L2	L3
Class 1: SU	0.5	0.5	0.0
Class 2: DM	0.5	-0.5	0.0
Class 3: UM	-0.5	0.0	0.5
Class 4: SL	-0.5	0.0	-0.5

The loglinear latent class model for the hypothetical cross-classification of father's occupation (R), son's occupation (C), and the latent class (L), without covariate effects can then be defined as

$$\log(F_{ijl}^{RCL}) = \lambda + \lambda_i^R + \lambda_j^C + \lambda_l^L + \lambda_{il_1}^{RL_1} + \lambda_{il_1}^{CL_1} + \lambda_{jl_2}^{CL_2} + \lambda_{jl_3}^{CL_3} + d_i\delta_{ij} \quad (1)$$

where (1) variable *L* without a subscript indicates the latent-class variable with four categories, and *L* with a subscript each indicates the variable for each contrast specified in Table 2, (2) parameters λ_l^L let the relative sizes among four latent classes be freely estimated without constraints, (3) parameters $\lambda_{il_1}^{RL_1}$ let the origin distribution differ

between the group of the SU and DM classes and the group of the UM and SL classes, but not within each group, (4) three sets of parameters $\lambda_{jl_1}^{CL_1}$, $\lambda_{jl_2}^{CL_2}$, and $\lambda_{jl_3}^{CL_3}$ let the status *destination* distribution vary with the four latent classes, and (5) $d_i\delta_{ij}$ -- where d_i is a parameter and δ_{ij} is Kronecker's delta and is equal to 1 if and only if $i = j$ and is equal to zero otherwise -- indicates the occupation-specific diagonal effects, which are not captured by the indirect association between origins and destinations through their associations with latent classes.

If we have a (I+1)-by-I mobility table by including the "missing" category for origin, the model of equation 1 uses (I-2) parameters for $\lambda_{il_1}^{RL_1}$ because $\lambda_{il_1}^{RL_1}$ must be set at 0 not only for the baseline category but also for the highest-status category and the lowest-status category; the model uses (I-1) parameters for $\lambda_{jl_1}^{CL_1}$ because $\lambda_{jl_1}^{CL_1}$ must be set at 0 only for the baseline category; the model uses (I-3) parameters for each of $\lambda_{jl_2}^{CL_2}$ and $\lambda_{jl_3}^{CL_3}$ because each factor must be set at zero not only for the baseline category but also for the highest-status and lowest-status categories. Note also that we impose correspondence between latent classes and observed mobility frequencies as specified in Table 1.

Clogg's two-class model becomes a special case of the model of equation 1 because we obtain the Clogg model when parameters that involve variables L_2 and L_3, that is, $\lambda_{jl_2}^{CL_2}$ and $\lambda_{jl_3}^{CL_3}$, are set at zero, and we let $L = L_1$.

The extension of the model of equation (1) to the multinomial logit latent-regression model (Yamaguchi 2000) is straightforward. Using the special contrasts for the latent-

class variable specified in Table 2, the extended model includes the *measurement* equation 1 given above, and the set of following three *regression* equations.

$$\log[(P_{SU}P_{DM})/(P_{UM}P_{SL})] = \sum_k \alpha_k x_k \qquad (2)$$

$$\log(P_{SU}/P_{DM}) = \sum_k \beta_k x_k \qquad (3)$$

$$\log(P_{UM}/P_{SL}) = \sum_k \gamma_k x_k \qquad (4)$$

Equation (2) indicates how covariate **X** affects mobility chances because of the association of covariate states with the distribution of status origins. Equation 3 indicates how covariates **X** affect mobility chances by decreasing downward mobility among those with relatively advantaged status origins, and Equation (4) indicates how covariates **X** affect mobility chances by increasing upward mobility among those with relatively disadvantaged status origins.

In addition, we also allow the diagonal immobility effects to depend on covariates such that

$$d_i = d_{0i} + \sum_k \phi_{ik} x_k \qquad (5)$$

The number of parameters that this equation introduces is rather many, and therefore, except for the key predictor variable namely race, we shall set constraints $\phi_{ik} = \phi_k$ so that the effects of other covariates are uniform and do not vary with occupations.

It is possible that covariates affect occupational origins and occupational destinations directly rather than affecting only the composition of latent classes as specified by regression equations 2, 3, and 4. However, we are considering the latent-

class variable specified by the measurement equation 1 as the theoretically meaningful *dependent* variable, and therefore, wish to avoid the complication in interpretation by allowing direct covariate effects on occupational origins and destinations. We should be concerned, however, with the goodness of fit of the model with data by a liberal BIC criterion for the three-way table including education as the only covariate so that we should assure that the imposition of conditional independence of education from occupational origins and destinations, when indirect effects through the latent-class variable are taken into account, does not seriously distort the characteristics of the data.

The simultaneous model, which consists of the measurement equation (equation 1) and regression equations 2, 3, 4, and 5, was applied by using program DNEWTON (Haberman 1988) as was done by Yamaguchi (2000) for a more general multinomial logit latent-class regression analysis.

DATA

The data are taken from the sample of men aged 20-69, and either a black or a white, in the General Social Survey 1972 to 2000. People of "other race", and those whose own occupation is "missing" are excluded from the sample. The sample size is 14,853 including 13,022 whites and 1,832 blacks. Table 3 presents the distribution of father's occupation, son's occupation, and son's education by race.

The occupational classification employed here follows a study by Featherman and Hauser (1977) except that no distinction is made between farmers and farm workers because this distinction generates unexpected status disinheritance of farmers because sons of farmers tend to report that they are farm workers when they work for farm family business. The classification proposed by Erikson and Goldthorpe (1992) was also considered but General Social Survey does not have information on ownership and firm size other than self-employment that the classification requires. Among the nine

occupational categories we distinguish, we assume the category of professional/technical workers as the highest-status category and the category of unskilled workers as the lowest-status category.

(Table 3 About Here)

ANALYSIS

The analysis is made in three steps. First, I analyze the three-way cross-classification of mobility table by education. Since this is the only frequency table that is not sparse, I use it for the goodness-of-fit test of models. Second, I analyze the four-way cross-classification of the mobility table by education and race. In this analysis, I identify the main characteristics of differences in mobility patterns between blacks and whites. Third, I analyze the five-way cross-classification of the mobility table by education, by race, and by period. In this analysis, I focus on the historical change in differences in mobility patterns between blacks and whites.

Table 4 presents the results of chi-square tests for various latent class models of three-way, four-way, and five-way tables. The first Model, M11, the two-class model that is equivalent with the model that Clogg (1981) applied –- though it is applied to the three-way table rather than to the two-way table here. The effects of education on the latent class and occupation-specific diagonal effects are also hypothesized to exist. Model 12 is the four-class model introduced in this paper. As shown in the results, this model improves the fit of model M11 greatly. Although the model is better than the saturated model according to BIC, it does not fit the data very well by the chi-square test. This occurs because the model does not take into account the direct effects of education on occupational origins and on occupational destinations. However, since BIC shows an adequate fit with data for a large sample analyzed here, I do not consider these direct

effects because we are concerned, in using these models, with covariate effects on the composition of latent mobility classes as the dependent variable to characterize the association of covariate states with the three elements of mobility chances.

(Table 4 About Here)

M13 further adds the uniform education effects on immobility (diagonal cells in the mobility table). While this model improves M12 according to the likelihood ratio (hereafter LL) test, it is worse in fit according to BIC. We shall reconcile this disagreement later for the four-way table analysis.

The first model tested for the four-way table including race is M21, which has parameters of M12 plus the race effects on the composition of latent classes. M22 adds to M21 the interaction effects of race and education on the latent class and is worse in fit than M12 according to both the LL test and BIC. M23 adds the interaction effects of race and each occupation on immobility, and improves the fit of M21 according to both LL test and BIC. M24 simplifies M23 and retains only the interaction effect of race and occupations 6 (skilled work) and 9 (farm work) on immobility. M24 is more parsimonious than M23 and is better than M21 according to both the LL test and BIC. M25 adds to M24 the uniform effects of education on immobility. As in the case of three-way table analysis, M25 is better than M24 according to the LL test but is worse in fit according to BIC. In order to reconcile the disagreement of these two test results, M26 modifies M25 so that only the effect of having less than 12 years of education versus other educational levels on immobility is hypothesized in M26. This model improves the fit of M24 and is more parsimonious than M25 according to both the LL test and BIC. Hence, M26 is the best-fitting model for the four-way table data.

For the five-way table that adds the period-effect variable with three categories, I tested only models that include effects involving the period variable by using the results from the four-way table analysis. The first model, M31, here includes the parameters of the best-fitting four-way table model (M26) and the period effects on the composition of latent classes. M32 adds to this model the interaction effects of education and period on the latent class, which does not improve the fit of M31 according to both the LL test and BIC. M33 adds to M31 the interaction effects of race and period on the latent class, which improves the fit of M31 according to the LL test but not according to BIC. In order to reconcile this disagreement of the two test results, M34 adds to M31 only the interaction effect of race and linear period -- which codes years 1972-80 as 0, years 1981-90 as 1, and years 1991-2000 as 2 –- on the third contrast (L3) of the latent variable. This model improves the fit of model M31 and is more parsimonious than model M33 according to both the LL test and BIC. Hence, M34 is the best model so far. M35 adds to M34 the uniform period effects on immobility. Since this model does not improve the fit of M34 by both tests, we obtain M34 to be the best-fitting model for the five-way table. Below, we describe the results from models M26 and M34.

Table 5 presents the estimated conditional probability distributions of father's occupations and son's occupations for each of the four latent classes based on M26. The results for M34 are almost completely identical and, therefore, omitted. The zero number put in a blacket is imposed by the assumptions for the characteristics of the four latent classes. The model also assumes the distribution of father's occupations to be the same between the SU and DM classes and between the UM and SL classes.

(Table 5 About Here)

Although we do not impose an unidmensional order among occupations, the odds of the SL or DM class versus the UM or SL class can be interpreted as revealing a latent order of status hierarchy among father's occupations with respect to the distribution of son's occupations. The order is as follows: (professional/technical) > (sales) > (managerial/administrative) > (proprietors) > (clerical workers) > (skilled workers) > (semiskilled workers) > (missing) > (farmers and farm workers) > (unslkilled workers). Although the order between "sales" and "managerial/administrative" is unexpected, the revealed order seems to be quite reasonable as the order of occupational origins in affecting better mobility chances for sons. Note that the "missing" status is quite low in status hierarchy and that "skilled" occupation is the neutral one in producing about equal proportions of the SU-and-DM classes and the UM-and-SL classes. Hence, occupational origins higher in status hierarchy than skilled occupations generate advantaged mobility chances and those lower in status hierarchy than skilled occupations generates disadvantaged mobility chances.

The distribution of son's occupations shows that more than 80% of sons attain either professional/technical or managerial/administrative positions among people in the SU class. This proportion is 51% for the UM class, 9% for the DM class, and 0.7% for the SL class. On the other hand, the proportion for sons to become manual workers or farmers/farm workers is 2% for the SU class, 15% for the UM class, 65% for the DM class, and 92% for the SL class. Hence, the mobility chance of the UM class is not as good as that of the SU class, and the mobility chance of the DM class is not as bad as that of the SL class.

Table 6 presents the estimates for the covariate effects on the three contrasts of the latent-class variable based on M26 and M34 models. Parameter estimates for the measurement part of equation (equation 1) are omitted from the presentation,

(Table 6 About Here)

The results from model M26 for the race effects clearly indicate the characteristics of disadvantages in mobility that blacks have compared with whites. The strongest race effect is the negative effect on L1, the contrast of being the SU and DM classes rather than the UM and SL classes due to a poorer occupational status background. In other words, the most significant handicap in occupational attainment that blacks have compared with whites comes from the fact that their status background is much lower, on average, than that of whites.

The second strongest race effect is the negative effect on L3, the contrast of being the UM class rather than the SL class. Note that the model controls for the effects of education on the composition of latent classes and no significant interaction effects of race and education on the composition are found, and therefore, this tendency for blacks to be less likely to experience upward mobility than whites apply within each educational level. In other words, despite affirmative action programs that are believed to give blacks with equal social opportunity, there has been a strong barrier to upward mobility for blacks compared with whites among people who have disadvantaged occupational status background.

The weakest, but significant, race effect is the negative effect on L2, the contrast of being in the SU class rather than the DM class. In other words, among people who have advantaged occupational status background, blacks are slightly more likely than whites to experience downward mobility, controlling for education. Note, however, that this modestly disadvantaged situation of having a greater probability of experiencing downward mobility applies to the minority among blacks, while the greatly disadvantaged situation of having much less probability of experiencing upward mobility applies to the majority.

The results from model M26 also show that each increase in the level of education systematically changes the composition of latent classes such that more highly educated people are advantaged in all three respects – with an exception for the effect of having less than 12 years of education on L2 such that apparently because the majority of those with less than 12 years of education have low occupational status background, their chance of experiencing downward mobility is not greater than that for people with 12 years of education.

The results from model M34 that includes the distinction of three time periods indicate, regarding the main period effects on the composition of latent classes, that although the mobility situation in 1981-90 is about the same as that in 1972-80, the likelihood for people to experience downward mobility significantly increased and the likelihood for people to experience upward mobility significantly decreased in years 1991-2000 compared with years 1972-91, controlling for the effects of education and race. This seems to come from the following reason. The expansion of educational attainment for more recent years has changed the composition of the four latent classes in such a way that would predict, other things being equal, the distribution of son's occupation that matches the educational expansion. In fact, since the creation of jobs that match the educational expansion did not take place in years 1990-2000, the proportion of people who have a worse mobility chance, that is becoming the DM class rather than the SU class, or becoming the SL class rather than the UM class, increased within each level of education. This generated the period effect reported in Table 5.

The only interaction effect between race and period on the latent-class composition is the positive interaction effect of race and linearly expressed period on L3, the contrast of the UM class versus the SL class. As shown in the analysis presented in Table 4, the interaction effects on the other two contrasts are nonsignificant. This finding indicates three things. First, the greatest handicap that blacks have in mobility chances

compared with whites, namely the handicap coming from poorer occupational status background, has not diminished at all in the past 30 years. In order to supplement this finding, Table 7 presents the distribution of father's occupation by race and by period. The table shows only a modest increase over time in the white-collar origin among blacks, and that the increase is not more than that among whites. The decline in manual origin is also modest among blacks as in the case of whites. While the farm background decreased greatly to about a half in 1991-2000 compared with 1981-90, this tendency is also the same for two races. On the other hand, there has been an increase in the missing father's occupation for both racial groups. While these changes are modest, except for a sharp decline in the farm background, the trends are basically the same between blacks and whites, thereby leading to the retention, over twenty years, of the original handicap that blacks had in having a greater proportion of manual origin and the missing origin and a smaller proportion of nonmanual origin than whites. Although we can see in Table 3 about son's occupational distribution a further improvement for blacks as is indicated by a greater proportion of professional/technical workers, we should also note that more than one third will fall in a severely disadvantaged "missing" category for the next generation as well, and this will significantly reduce the modest improvement in class background that blacks will have for the next generation to come.

(Table 7 About Here)

The picture that the second finding indicates, however, is somewhat brighter. There has been a steady improvement over time in the odds of experiencing upward mobility for blacks compared with whites among people who have disadvantaged occupational status background. The log odds-ratio became less than a half in 1991-2000 [-0.491 = -1.345+2$\times$0.427] compared with that in 1972-80 (-1.345). This handicap in years 1991-

2000 about not having as much chance of upward mobility as whites has become about the same in extent as that for the handicap about having a greater probability of experiencing downward mobility (-0.506). We shall analyze later the effects of these compositional changes more concretely.

The third finding is that the modest handicap that blacks have compared with whites in having a greater probability of experiencing downward mobility among people who have advantaged occupational status background remained the same over the past 30 years.

Table 8 presents the results for diagonal effects, i.e., immobility effects, not explained by the association of father's and son's occupations due to the presence of the four latent mobility classes.

(Table 8 About Here)

The characteristics of these immobility effects are well documented in the literature, and therefore, only a few remarks are needed here. There are significant diagonal effects for each occupation except for clerical occupation, and the effects are especially strong for three occupations with a higher proportion of self-employment among whites, namely for (1) proprietors, (2) skilled workers, and (3) farmers and farm workers. For blacks, however, the immobility effects are greatly reduced for skilled occupations and farm occupations, partly due to a smaller proportion of the self-employed in these two occupations for blacks than whites, but skilled status shows even a tendency for status disinheritance among blacks.

Table 9 presents, based on the results from M26, a decomposition of the white and black population by education into five groups, which consist of the four latent mobility classes and those whose immobility is not explained by mobility chances of the latent

classes. The last group is labeled as IM in Table 9. The results from M34 are basically the same those from M26 and are, therefore, not presented.

(Table 9 About Here)

The results from Table 9 above all show that while each group contributes to a sizable proportion among whites, a large majority (71%) of blacks is classified as the SL class members. The second largest (17%) is the UM class among blacks, and as a result, about 88% of blacks belong to one of these two groups. This is a result from two findings reported previously. One is the severe handicap that blacks have in their status background compared with whites, and this makes the proportion of both the SU and DM classes to be very small in size. The second is the much smaller proportion of immobile people not only because of weaker diagonal effects of skilled and farm occupations, but also because they have smaller proportions of father's occupations that show relatively strong immobility effects such as proprietors and sales workers.

The decomposition of population into five groups by education shows that among whites an increase in education leads to a steady increase in the proportion of the SU class, a steady decrease in the SL class, and curvilinear changes in the proportion of the two mobile classes. The curvilinear effects occur because as education increases from the lowest (less than12 years) to the middle level (13-15 years), an increase in the proportion of the UM class occurs because higher educational attainment at these levels promotes upward mobility among those with disadvantaged status background, but also an increases in the proportion of the DM class also occurs because higher educational attainment at these levels increases the proportion of people with advantaged background more rapidly than a decrease in the DM class due to the reduced odds of the DM class compared with the SU class among people with advantaged background.

However, a further increase in the level of education over 13-15 years reduces the proportion of the DM class because at these higher educational levels, an expansion of those with advantaged status background is not as rapid as the decrease in the DM class due to a diminishing odds of the DM class among those advantaged people. This further increase in the level of education also reduces the proportion of the UM class because the decrease in the proportion of the disadvantaged class is more rapid than the increase in the UM due to an increased odds of the UM class among them.

On the other hand, the pattern of change in the composition of four latent classes among blacks is different because the curvilinear effects found for whites are absent. As education increases, the SL class steadily decrease, and both the UM and SU classes steadily increase -- except that at the highest level of education, the UM class becomes smaller apparently because these small number of blacks with the highest level of education (4.4% of blacks in Table 1) already have advantaged status background, and therefore, likely to be in the SU class rather than the UM class. Unlike whites, the size of the DM class is consistently small for blacks.

Table 10 shows based on the results from M34 the change in the composition of five groups by race and by period. Note that except for the interaction effect between race and period on the odds of being in the UM class versus the SL class, changes observed here are due to (1) changes in the distribution of occupational origin over time, (2) changes in the composition of educational levels over time, and (2) the main period effects reported in Table 6. For example, the gradual increase over time in both the SU and DM classes for both blacks and whites are due primarily to the improvement of status background for both groups over time.

(Table 10 About Here)

The most conspicuous finding in the results of Table 11 is an increase in the proportion of the UM class over time among blacks: its size more than doubled in years 1991-2000 compared with years 1972-80. This mainly reflects the interaction effect of race and period reported in Table 6 -- although the increased educational attainment among blacks also contributed to this change. At the same time, we can also observe that the DM class also doubled – though its absolute size is smaller than that of the UM class. As a result, blacks have become more mobile in more recent years. As a retrospect, I consider that Duncan's (1968) finding based on OCG-I that blacks tended to end up in semi-skilled and unskilled occupations regardless of origin gave a false impression of mobility among blacks. In fact, there are only a tiny fraction of blacks with nonmanual origin, and therefore, the typical pattern of mobility was from lower manual origin (semiskilled and below) to the same destination, and therefore, blacks were not mobile at that time, and even less so than the results for years 1972-80 reported here. The concern for the association between father's and son's occupation by ignoring, or controlling for, marginal distributions tended to have obscured this basic fact.

CONCLUSION

This mobility chance of blacks compared with whites has been improved steadily but very slowly in the past 30 years. Blacks are severely handicapped in social mobility compared with whites in three respects. First, they have much poorer occupational status background than whites. Second, among people who have disadvantaged status background, the odds of experiencing upward mobility are much smaller for blacks than for whites controlling for education, but this handicap has been reduced steadily over time. Third, among people who have advantaged status background, the odds of experiencing downward mobility are greater for blacks than for whites, controlling for education.

The major reason for the slow pace of improvement in racial equality of mobility chances is that black's greatest handicap due to poorer status background has persisted without a significant change. Although the chance of having upward mobility has increased, thereby leading to a slightly larger proportion of blacks with advantaged status background, not only that improvement is not greater than that for whites, but also the fact that more than one third of blacks in recent years have missing father's occupation, mainly due to the fact that increasingly more blacks are born out of wedlock, tend to offset the effects of having greater upward mobility. Indeed, people in the missing-origin category are among the most handicapped in mobility chances, and as long as this tendency continues, it will make the impact of improvement in upward mobility to be modest in improving the betterment of class background for the next generation.

This multinomial logit latent-class regression model introduced in this paper will be useful beyond the current application to the analysis of racial comparison of social mobility. A simple characterization of mobility chances by the three elements will facilitate a clearer understanding of the differences in mobility chances among various groups in a society, than other methods currently available for social stratification research.

REFERENCE (INCOMPLETE)

Aschaffenburg, Karen E. 1995. “Rethinking Images of the Mobility Regime: Making a Case for Women’s Mobility.” *Research in Social Stratification and Mobility* 14: 201-235.

Breiger, Ronald L. 1981. ”The Social Class Structure of Occupational Mobility.” *American Journal of Sociology* 87:578-611.

Chase, Ivan D. 1975. “A Comparison of Men’s and Women’s Intergenerational Mobility In the United States.” *American Sociological Review* 40: 483-505.

Clogg, C.C. 1981. “Latent *Structure Models of Mobility,” American Journal of Sociology 86: 836-868.*

DiPrete, Thomas A. 1990. “Adding Covariates to Loglinear Models for the Study of Social Mobility.” *American Sociological Review* 55: 753-73.

Duncan, O. Dudley. 1968. “Patterns of Occupational Mobility among Negro Men.” *Demography* 5: 11-22.

Duncan, O. Dudley. 1979. “How Destination Depends on Origin in the Occupational Mobility Table.” *American Journal of Sociology* 84:793-803.

David L. Featherman and Robert M. Hauser (eds.), *Opportunity and Change*. New York: Academic Press.

Erikson, Robert and John H. Goldthorpe. 1992. *The Constant Flux:A Study of Class Mobility in Industrial Societies*. Oxford: Oxford University Press.

Haberman, Shelby. 1988. “A Stabilized Newton-Raphson Algorithm for Log-Linear Models for Frequency Tables Derived by Indirect Observation.” Pp. 193-221 in C.C. Clogg (ed.), *Sociological Methodology* 18. Washington, D.C.: American Sociological Association.

Hauser, Robert M. 1979. “Some Exploratory Methods for Ransacking Mobility Tables and Other Cross-Classification Data.” Pp.413-38 in K.F. Shuessler (ed.), *Sociological Methodology* 1980: San Francisco: Jossey-Bass.

Hauser, Robert M. 1984. “Vertical Class Mobility in England, France, and Sweden.” *Acta Sociologica* 27: 87-110.

Hauser, Robert M., and David L. Featherman (eds). 1977. *Process of Stratification.* New York: Academic Press.

Hauser, Robert M., David L. Featherman, and Denise Hogan. 1977. “Sex in the Structure of Occupational Mobility in the United States, 1962.” Pp. 191-215 in R.M. Hauser and D.L. Featherman (*eds*), *Process of Stratification*. New York Academic Press.

Hauser, Robert M. and David B. Grusky. 1988. “Cross-National Variation in Occupational Distributions, Relative Mobility Chances, and Intergenerational Shifts in Occupational Distributions.” *America Sociological Review* 53: 723-741.

Hout, Michael. 1983. *Mobility Tables*. Beverly Hills, CA:Sage.

Hout, Michael. 1984a. “Status, Autonomy, and Training in Occupational Mobility,” *American Journal of Sociology* 89: 1979-1409.

Hout, Michael. 1984b. “Occupational Mobility of Black Men: 1962 to 1973.” *American Sociological Review* 49: 308-322.

Hout, Michael. 1988. “More Universalism, Less Structural Mobility: The American Occupational Structure in the 1980s.” *American Journal of Sociology* 93: 1358-1400.

Grusky, David B. and Robert M. Hauser. 1984. “Comparative Social Mobility Revisited: Models of Convergence and Divergence in 16 Countries.” *American Sociological Review* 49: 19-38.

Li, Jiang H. and Joachim Singlemann. 1998. “Gender Differences in Class Mobility: A comparative Study of the United States, Sweden, and West Germany.” *Acta Sociologica* 41:

Logan, John A. 1983. “A Multivariate Model for Mobility Tables.” *American Journal of Sociology* 89: 324-49.

Magidson, J. and J.K. Vermunt. 2001. “Latent Cluster Factor and Cluster Models, Bi-plots and Related Graphical Displays.” M. Becker and M. Sobel (eds.), *Sociological Methodology 2001, Vol. 31: 223-264.*

Marsden, Peter V. 1985. “Latent Structure Models for Relationally Defined Social Classes.” *American Journal of Sociology* 90: 1002-21.

Sobel, Michael E., Michael Hout, and O. Dudley Duncan. 1985. “Exchange, Structure, and Symmetry in Occupational Mobility.” *American Journal of Sociology* 91: 359-72.

Sobel, E. Michael, Mark P. Becker, and Susan M. Minick. 1998. “Origin, Destination, and Association in Occupational Mobility.” *American Journal of Sociology* 104: 687-721.

Stevens, Gillian and Monica Boyd. 1980. “The importance of Mother: Labor Force Participation and Intergenerational Mobility of Women.” *Social Forces* 59: 186-99.

Tyree, Andrea and Judith Treas. 1974. “The Occupational and Marital Mobility of Women,” *American Sociological Review* 39: 293-302.

Weber, Max. (1922) 1978. *Economy and Society*. Edited by G. Ross and C. Wittich. Berkeley: University of California Press.

Wilson, William J. 1978. *The Declining Significance of Race*. Chicago: The University of Chicago Press.

Wong, Raymond S.K. 1990. “Understanding Crossnational Variation in Occupational Mobility.” *American Sociological Review* 55: 560-73.

Wong, Raymond. S.K. 1992. “Vertical and Nonvertical Effects in Mobility: Crossnational Variations.” *American Sociological Review* 57: 396-410.

Xie, Yu. 1992. “Logmulticative Layer Effect Model for Comparing Mobility Tables.” *American Sociological Review* 57: 380-95.

Yamaguchi, Kazuo. 1983. "The Structure of Intergenerational Occupational Mobility: Generality and Specificity in Resources, Channels and Barriers." *American Journal of Sociology* 88: 718-745.

Yamaguchi, Kazuo. 1987. "Models for Comparing Mobility Tables: Toward Parsimony and Substance." *American Sociological Review* 52: 482-494.

Yamaguchi, K. 2000. “Multinomial Logit Latent-Class Regression Models: An Analysis of Predictors of Gender-Role Attitudes among Japanese Women.” *American Journal of Sociology* 105: 1702-40.

Yasuda, Saburo. 1964. “A Methodological Inquiry into Social Mobility.” *American Sociological Review* 29: 16-23.

Table 3. Frequency Distribution of Main Variables by Race

	Whites		Blacks	
	Frequency	%	Frequency	%
1. Father's occupation				
professional/technical (H)	1,244	9.6	53	2.9
managers/administrators	846	6.5	38	2.1
proprietors	783	6.0	35	1.9
sales workers	736	5.7	12	0.7
clerical workers	425	3.3	42	2.3
skilled workers	2,717	20.9	207	11.3
semi-skilled workers	2,322	17.8	372	20.3
unskilled workers (L)	549	4.2	183	10.0
farmers and farm workers	1,727	13.3	327	17.9
missing	1,655	12.7	562	30.7
2. Son's occupation				
professional/technical (H)	2,306	17.7	183	10.0
managers/administrators	1,429	11.0	81	4.4
proprietors	583	4.5	25	1.4
sales workers	1,009	7.7	63	3.4
clerical workers	767	5.9	131	7.2
skilled workers	2,888	22.2	319	17.4
semi-skilled workers	2,892	22.2	755	41.2
unskilled workers (L)	668	5.1	227	12.4
farmers and farm workers	480	3.7	47	2.6
3. Education				
11 years or less	2,653	20.3	613	33.5
12 years	3,913	30.0	570	31.1
13-15 years	3,055	23.5	437	23.9
16 years	1,799	13.8	131	7.2
17 years or more	1,602	12.3	80	4.4

Table 4. Main Results for Models for Three-Way, Four-Way and Five-Way Tables

	G^2	df	BIC
I. Analysis of Three-Way [10 (FO) × 9 (SO) × 5 (ED)] Table			
M11. Basic 2-class model	2,809.3	399	-1,023.8
M12. Basic 4-class model	1,012.8	377	-2,608.7
M13. M2 + Education effects on the diagonal	980.4	373	-2,602.8
II. Analysis of Four-Way [10(FO)×9(SO)×5(ED)×2(Race)] Table			
M21. M12+Race effects on Latent classes	2,091.0	819	-5,776.3
M22 M21+(Race×Education) effects on latent classes[1]	2,081.0	810	-5,699.9
M23. M21+race×diagonal effects	1,949.7	810	-5,831.2
M24. M21+race× (diagonal 6) +race×(diagonal 9)	1,959.8	817	-5,888.4
M25. M24+Education effects on the diagonal	1,935.1	813	-5,874.6
M26. M24 +Edu_1(<12) on the diagonal	1,942.6	816	-5,895.9
III. Analysis of Five-Way [10(FO)×9(SO)×5(ED)×2(Race)×3(Period)] Table			
M31. M26+Period effects on latent classes	3,777.1	2,590	-21,102.4
M32 M31 + (Education×Period) Effects on Latent Classes	3,754.5	2,566	-20,894.4
M33. M31 + (Race×Period) Effects on Latent Classes	3,763.1	2,584	-21,058.8
M34. M31 + (Race×Ln_Period) Effect on L3	3,767.1	2,589	-21,102.8
M35 M34+Peried Effects on the Diagonal	3,761.8	2,587	-21,088.9

[1]For this interaction between race and education, the two upper categories of education is combined as “16 years and over” to attain a convergence.

Table 5: Occupational Distributions of the Four Latent Classes Based on Model M26

Occupation[2]	SU Father	SU Son	DM Father	DM Son	UM Father	UM Son	SL Father	SL Son
professional/technical (H)	0.180	0.583	0.180	[0.000]	[0.000]	0.289	[0.000]	[0.000]
managers/administrators	0.126	0.223	0.126	0.092	0.007	0.226	0.007	0.008
proprietors	0.092	0.047	0.092	0.042	0.019	0.057	0.019	0.023
sales workers	0.102	0.091	0.102	0.126	0.005	0.118	0.005	0.015
clerical workers	0.057	0.032	0.057	0.095	0.013	0.158	0.013	0.032
skilled workers	0.186	0.000	0.186	0.281	0.184	0.107	0.184	0.312
semi-skilled workers	0.124	0.017	0.124	0.280	0.251	0.045	0.251	0.466
unskilled workers (L)	[0.000]	[0.000]	[0.000]	0.069	0.098	[0.000]	0.098	0.121
farmers and farm workers	0.041	0.006	0.041	0.015	0.200	0.000	0.200	0.024
missing	0.092	-------	0.092	-------	0.223	-------	0.223	-------
total	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

[1]Numbers in the bracket are those whose zero values are imposed by the model.
[2]Category with (H) is assumed to be the highest in status, and category with (L) is assumed to be the lowest in status.

Table 6. Covariate Effects on the Composition of Latent Classes

	Model M26			Model M34		
	The effects on					
	L1	L2	L3	L1	L2	L3
1. Education (vs. 12 years)						
<12	-1.096	0.150	-1.562	-1.087	0.078	-1.555
	(4.91)	(0.40)	(8.51)	(4.87)	(0.20)	(8.56)
13-15	1.424	1.247	1.370	1.428	1.278	1.382
	(12.18)	(7.69)	(10.70)	(12.22)	(7.89)	(10.80)
16	3.064	3.222	4.025	3.124	3.230	4.117
	(9.34)	(17.59)	(7.18)	(9.08)	(17.68)	(6.88)
17+	3.543	4.827	4.225	3.571	4.818	4.203
	(5.91)	(21.44)	(3.77)	(5.82)	(21.32)	(3.62)
2. Race (vs. whites)						
blacks	-2.386	-0.516	-0.829	-2.359	-0.506	-1.345
	(15.9)	(2.01)	(6.53)	(15.72)	(2.00)	(5.93)
3. Period (vs. 1972-1980						
1981-1990	-------	-------	-------	0.129	-0.217	-0.033
				(1.38)	(1.87)	(0.30)
1991-2000	-------	-------	-------	0.142	-0.360	-0.256
				(1.46)	(3.17)	(1.98)
4. Interaction (vs. whites)						
blacks x linear period[1]	-------	-------	-------	-------	--------	0.427
						(2.81)

[1]The linear period variable gives a value of 0 to years 1972-80, 1 to years 1981-90, and 2 to years 1991-2000.

Table 7. Distribution of Occupational Origins by Race and by Period

	Whites			Blacks			
	72-80	81-90	91-00	72-80	81-90	91-00	1
professional/technical	7.1	9.3	12.1	2.8	2.6	3.3	
managers/administrators	4.9	7.4	7.5	1.0	1.0	4.2	
proprietors	7.3	6.3	4.3	1.0	2.6	1.8	
sales workers	3.3	5.2	8.1	0.6	0.8	0.8	
clerical workers	3.3	3.4	3.2	1.0	2.9	2.6	
skilled workers	23.1	21.1	18.6	9.4	12.1	11.9	
semi-skilled workers	18.4	17.9	17.3	21.6	19.8	19.9	
unskilled workers	4.6	4.5	3.7	11.4	9.2	9.8	
farmers and farm workers	17.5	12.7	9.9	24.7	17.8	12.2	
missing	10.8	11.8	15.3	26.5	31.3	33.3	
total	100.0	100.0	100.0	100.0	100.0	100.0	

Table 8. Diagonal Effects

	Model M26		Model M34	
1. Main diagonal effects				
professional/technical	0.373	(5.15)	0.369	(5.10)
managers/administrators	0.293	(3.00)	0.293	(3.00)
proprietors	1.397	(11.73)	1.412	(11.82)
sales workers	0.646	(5.95)	0.630	(5.80)
clerical workers	0.295	(1.68)	0.301	(1.71)
skilled workers	0.744	(14.73)	0.744	(14.69)
semi-skilled workers (B)	0.167	(3.03)	0.172	(3.11)
unskilled workers (L)	0.316	(2.39)	0.321	(2.43)
farmers and farm workers	2.802	(25.20)	2.813	(25.21)
2. Interaction effects with race (blacks vs. whites) on the diagonal				
skilled workers	-1.192	(7.97)	-1.205	(8.06)
farmers and farm workers	-1.280	(6.16)	-1.282	(6.16)
2. Uniform effects of education on the diagonal				
<12 vs. 12 years or more	-0.222	(4.12)	-0.226	(4.20)

Table 9. Composition of Latent Classes by Race and Education
Based on Model M26.

	SU	DM	UM	SL	IM
1. Whites: total	0.229	0.246	0.123	0.314	0.087
<12	0.011	0.082	0.054	0.775	0.078
12	0.035	0.308	0.137	0.423	0.106
13-15	0.172	0.436	0.173	0.132	0.086
16	0.565	0.198	0.154	0.008	0.074
17+	0.799	0.056	0.067	0.003	0.075
2. Blacks: total	0.046	0.062	0.174	0.711	0.007
< 12	0.001	0.008	0.030	0.981	-0.019
12	0.003	0.048	0.118	0.811	0.020
13-15	0.032	0.135	0.297	0.519	0.017
16	0.220	0.130	0.560	0.069	0.022
17+	0.485	0.057	0.379	0.038	0.041

Table 10. Composition of Latent Classes by Race and Period
Based on Model M34

	SU	DM	UM	SL	IM
1. Whites:					
1972-1980	0.196	0.204	0.130	0.384	0.087
1981-1990	0.227	0.254	0.131	0.301	0.087
1991-2000	0.262	0.277	0.115	0.257	0.088
2. Blacks:					
1972-1980	0.032	0.037	0.104	0.826	0.001
1981-1990	0.050	0.065	0.179	0.699	0.007
1991-2000	0.054	0.085	0.226	0.624	0.011