

# Discrimination Over the Life Course: A Synthetic Cohort Analysis of Earnings Differences Between Black and White Males, 1940-1990\*

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*Using data from the 1940-1980 United States Microdata Extract File and the Current Population Survey's 1990 Annual Demographic File, this study examines three competing explanations of the disparity in black and white male earnings over the life course. The "legacy of discrimination" explanation suggests that current racial disparities in earnings reflect nothing more than past discrimination against older blacks, and that the earnings of younger black and white males should be similar over the life course. The "cumulative effects of discrimination" explanation suggests that the black-white earnings gap increases over the life course, and that this divergence in earnings exists for younger cohorts of males as well as older cohorts. The "vintage hypothesis" argues that the net black-white earnings gap reflects differences in self-investments in human capital and that the racial earnings gap should be virtually constant over time and over the life course for all cohorts (vintages) of black and white male workers. This study presents a synthetic cohort analysis of the effects of aging on the disparity in earnings for black and white males from 1940-1990. It shows that aging has a curvilinear effect on the black-white earnings gap. Younger black males in each year and cohort analyzed were closer to their white male counterparts than middle-aged blacks. However, there was a convergence in the earnings of elderly black and white males. While not completely consistent with any of the formulations, the findings most closely conform to the predictions of the cumulative effect of discrimination explanation.*

## Introduction

Black Americans continue to represent one of the most disadvantaged groups in the United States. Despite the widely held view that they have shown steady improvements in their earnings relative to those of whites, recent studies report that irrespective of the measure or standard of socioeconomic well-being, blacks have yet to achieve parity with whites (Jaynes and Williams 1989). Some explanations of present black disadvantage suggest that it is nothing more than the "legacy of past discrimination" (e.g., Wilson 1978). Others explain racial inequalities in terms of "vintage" differences in earnings between cohorts that can be explained by differences in racial group-specific experience and human capital profiles (e.g., Welch 1973). Still others propose an explanation of the black-white earnings gap that suggests that racial differences have not disappeared because of the "cumulative effects" of discrimination against black workers over the life course (e.g., Thomas 1993).

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To test the competing claims of the “legacy of past discrimination,” the “vintage hypothesis,” and the “cumulative effects of discrimination” explanations of racial disparities in earnings requires a cross-time analysis of how race and age have affected the earnings of blacks and whites over the years. This requires a disentangling of age, time period, and the cohort effects of race on earnings for different cohorts of black and white workers.

In this study, we provide such an analysis of age-related racial disparities in earnings using data spanning the six decades from 1940 to 1990. The study has two parts. The first part is a cross-sectional examination of racial differences by age in 10 year intervals from 1940 to 1990. We use this to illustrate the nature of the race-age-period interaction. In the second part of the study, we provide an analysis of five age cohorts. We do this to provide insight into the nature of changes in racial inequality in earnings over time and the life course.

The samples we use are not from a panel study. They are, however, representative samples of the same population at different points in time; thus, they provide an appropriate estimation of the status of each cohort at each point in time, and they are appropriate for our synthetic cohort analysis. In both parts of the analysis, we examine earnings differences between black and white males while applying statistical controls for relevant sociodemographic characteristics.

## Models of Black-White Earnings Over the Life Course

### *The Legacy of Past Discrimination*

The legacy of past discrimination explanation for current black-white earnings differences gained prominence through the publication of William Julius Wilson’s book, *The Declining Significance of Race* (1978, 1980). In this work, Wilson (1980) argued that class had superseded race as the most important factor explaining the situation of blacks in America. He contends that in the modern industrial period, economic growth and state intervention in the form of civil rights legislation, administrative action to improve civil rights, and the implementation of affirmative action policies have created a large black middle class primarily through the creation of job opportunities and the removal of racial barriers in education and in government and corporate employment. At the same time, segmentation of labor markets, the movement of industries out of central cities, and the decline in the production of goods relative to the production of services have created a social and economic situation that perpetuates black poverty.

These economic factors, according to Wilson, have created a large and growing black underclass that lacks the cultural, social, and economic resources to take advantage of the new opportunities (Wilson 1987). Current discrimination, Wilson (1980, 1987) argues, is not the primary cause of the problem of the black underclass. Past discrimination created the black underclass which continues today primarily because of economic and other non-racial factors. Moreover, Wilson (1978:17) contends:

There is still a significant income gap between all college educated whites and all college educated blacks because of the substantially lower income of older educated blacks. But is this mainly a consequence of present-day discrimination . . . ? No, the comparatively low incomes of older blacks is one of the legacies of past discrimination.

Thus for Wilson and other proponents of the legacy of past discrimination, differences in measures of well-being across social classes for blacks and whites are attributable primarily to the low life chances of older blacks who were victims of past discrimination. Thus, from a cohort analysis framework, the legacy of past discrimination perspective parallels a period effects-driven model of change in racial differences in earnings.

### *The Cumulative Effects of Discrimination*

In answering Wilson's (1978:17) contention that "there is still an income gap between all college educated blacks and all college educated whites because of the substantially lower income of older educated blacks . . . because of a legacy of past discrimination," Willie (1979:55) utilizes statistics provided by the U.S. Civil Rights Commission titled *Social Indicators of Equality for Minorities and Women*. This study presents statistical adjustments using multiple regression for each minority groups' educational level, job prestige, income level in the state of residence, weeks worked, hours recently worked, and age. According to Willie (1979:55), based on this study,

one may conclude that even when all things are equal (including age, education and occupation), blacks and other minorities receive an annual income that is 15 to 20 percent less than that received by majority males. These findings indicate that racism is alive and well in the United States.

More recent studies have also challenged the "legacy of past discrimination" explanation of earnings differences between blacks and whites. Cotton (1990), Thomas (1993), and Thomas and Horton (1992) have offered an alternative explanation for the narrowing of the racial gap for the younger aged group. They propose that younger blacks have always done better than older blacks when compared with similar whites because the negative impact of discrimination is cumulative over the life course. Thomas (1993) found that younger blacks were better off compared with similar whites than older blacks in both 1968 and 1988. He suggests that "the negative impact of discrimination is relatively small for younger blacks, but over time increases and becomes large for middle-aged and older blacks" (1993:613).

Thomas and Horton (1992), in a similar study of racial differences in family income, found that the race effect on family income was smaller for families with younger reference persons than those with older reference persons. They conclude that rather than reflecting the effects of past discrimination, the data suggest that the effects of race increased over the life course. Cotton's analysis of black-white earnings differences suggests that labor market discrimination increases over time, "particularly as blacks and women with experience and seniority become eligible for the policy and decision-making slots in the higher reaches of business and the professions" (1990:25).

So despite optimistic projections about a color-blind society, proponents of the cumulative effects of discrimination model would suggest that blacks in each era are confronted by discrimination, the effects of which accumulate over the life course. It is theoretically possible that the cumulative effects of discrimination will cease to exist under periods of economic growth and declining racial prejudice and discrimination. The empirical reality according to the cumulative effects of discrimination model, however, is that blacks in America have historically been faced with seeming progress and subsequent retrenchment in which temporary economic gains have been misappropriated. Thus, from a cohort analysis framework, the cumulative effects of discrimination explanation is analogous to an age effects-driven model of change in racial differences in earnings.

### *The Vintage Hypothesis*

Another explanation of the present gap in earnings between blacks and whites is what has become known as the "vintage hypothesis" (e.g., Welch 1973, 1975, 1980; Link, Ratledge, and Lewis 1976, 1980; Smith and Welch 1977; Hoffman 1979; Akin and Garfinkel 1980; and Duncan and Hoffman 1983). According to this view, labor market earnings reflect levels of productivity for individuals at different stages of their lives. Differences in productivity in turn result from differences in self-investments in human capital such as education and on-the-job training.

Welch (1973), the originator of this perspective, suggests that differences in the quality of education have played a major role in the observed gap between blacks and whites. Thus, because blacks have historically attended lower quality schools, income returns to schooling for blacks have been less than for whites.<sup>1</sup> Recently, however, the black-white earnings gap has begun to close because the returns to education have risen faster for blacks than for whites as the quality of education for blacks has improved for more recent cohorts. Among those with at least some college, for example, returns to schooling have begun to be as high for blacks as they are for whites (Welch 1973; Smith and Welch 1977). Thus, proponents of the vintage hypothesis argue that there are cohort-differentiated racial variations in earnings: Older vintages of blacks who received poorer educations received lower returns to their educational investments than their white counterparts. These racial differences have been compounded over the years and have led to a divergence of earnings over the life cycle. Newer vintages of more equally educated young blacks experience similar earnings profiles to their white counterparts. There should be no divergence in the earnings of blacks and whites over the years for these newer cohorts. Moreover, vintage (cohort) effects should be stronger for blacks than they are for whites.

The important questions with respect to black-white life cycle differences in earnings include whether labor market dynamics operate differently for blacks and whites, whether such racial differences have been constant over the years, and whether such racial differences are constant over the life course. Clearly, the vintage hypothesis specifies that the labor market now operates the same for blacks and whites, that this similar operation is a change from previous eras when blacks experienced discrimination, and that now that discrimination has been diminished younger blacks should experience the same labor market dynamics over their lives that younger whites do. Thus, from a cohort analysis framework, the vintage hypothesis is equivalent to a cohort effects-driven model of change in racial differences in earnings.

### *Some Competing Hypotheses*

The three models of black-white earnings disparities over the life course make similar predictions about the well-being of young blacks relative to young whites and older blacks relative to older whites: The earnings gap should be smallest for the youngest workers and largest for the oldest workers, net of relevant work characteristics. These models differ, however, in their predictions about the nature of *change* in the gaps over time and over the life course. As Diagrams 1A and 1B show, the legacy of discrimination model predicts that net of relevant characteristics, the black-white earnings gap should become smaller over time, especially for younger cohorts (due to declining racial discrimination), but any such dissimilarities in earnings should remain relatively constant over the life course for younger (post-1960s) cohorts. In other words, if the legacy of past discrimination is the most significant factor, its effects should be observed over time in the form of older blacks starting out behind their white counterparts during the period before the Civil Rights Movement and remaining behind through the present, and younger blacks starting out on more equal footing with their white counterparts and maintaining that parity throughout their life times.

Diagram 2 illustrates the predictions of the cumulative effects of discrimination model. This model predicts that net of relevant characteristics, gaps in earnings at any point in time should reflect levels of discrimination against black workers, but the black-white earnings gap should also become progressively larger for each cohort as they progress through the life

1. As one of the anonymous reviewers points out, it is difficult to argue that differences in the *quality* of education, per se, are reflections of *self-investments*. Rather, it is perhaps more accurate to say that such differences reflect *social investments* in individuals. Still, the central point is that according to the vintage hypothesis, as education becomes more equal, earnings should also become more equal.

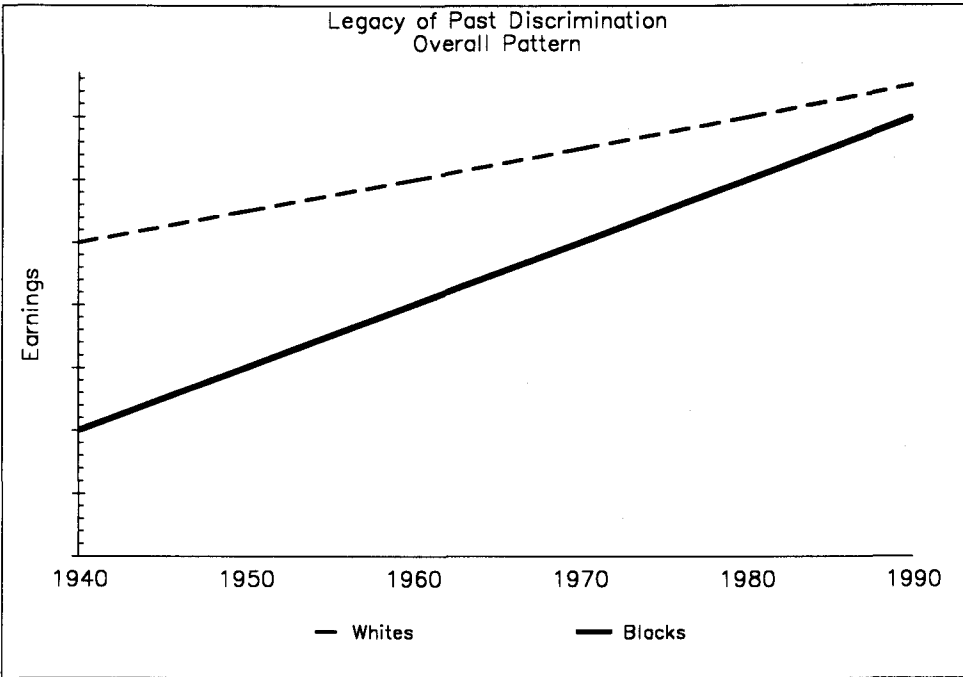


Diagram 1a

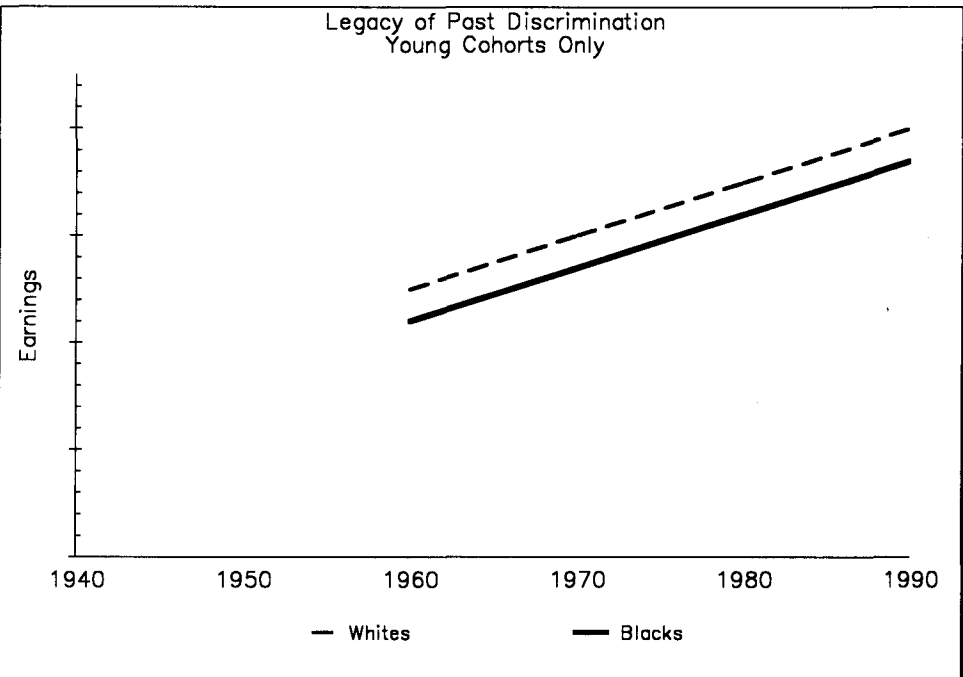


Diagram 1b

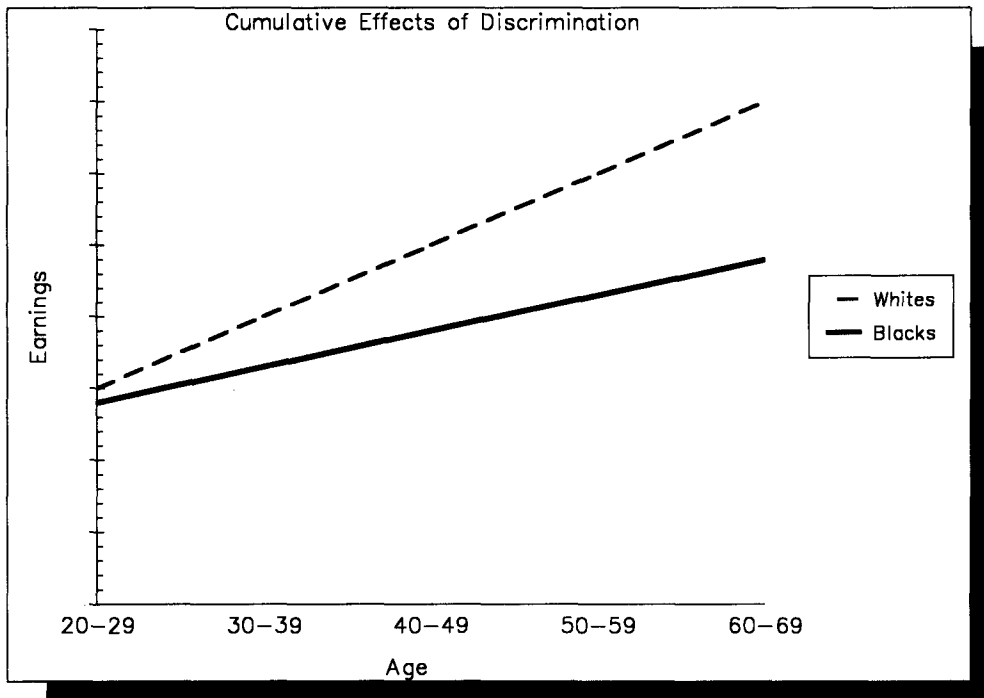


Diagram 2

cycle. In other words, if the cumulative effects of discrimination explanation is accurate, the negative effects of discrimination should increase over the life course of black Americans. This should be observed in the form of increasing racial disparities in age cohorts over time. Diagrams 3A and 3B illustrate the vintage hypothesis. This model suggests that blacks and whites would have similar earnings if they had similar levels of human capital. Therefore, as blacks' levels of human capital begin to more closely approximate those of whites, their earnings will do likewise. Thus, the vintage hypothesis predicts that once work-relevant characteristics (such as education) have been taken into account, the black-white earnings gap should be virtually constant over time for all cohorts (vintages). To the degree that black-white human capital gaps have closed since the 1960s, Diagrams 3A and 3B accurately represent the vintage model.

Below, we examine the accuracy of these predictions. First, however, we provide a brief description of the data and methods that we used to test these predictions.

### The Cohort Analysis Framework

The most significant contribution of the cohort analysis framework is its emphasis on simultaneously considering age, period, and cohort effects when approaching substantive issues. In most instances, considering any one of these effects without regard to the others is a misleading assessment. When a standard cohort table has been constructed, the identification of age, period, and cohort effects would appear to be rather straightforward. *Age effects* can be determined by examining *intracohort* differences (i.e., by reading the cohort table diagonally down and to the right). This allows one to compare, for example, the earnings of the cohort age 30-39 in 1950 with the earnings of that same cohort 10 years later (in 1960) when its members would then be age 40-49, and to compare them both with the same cohort 10 years later (in 1970) when its members would then be age 50-59. This process could

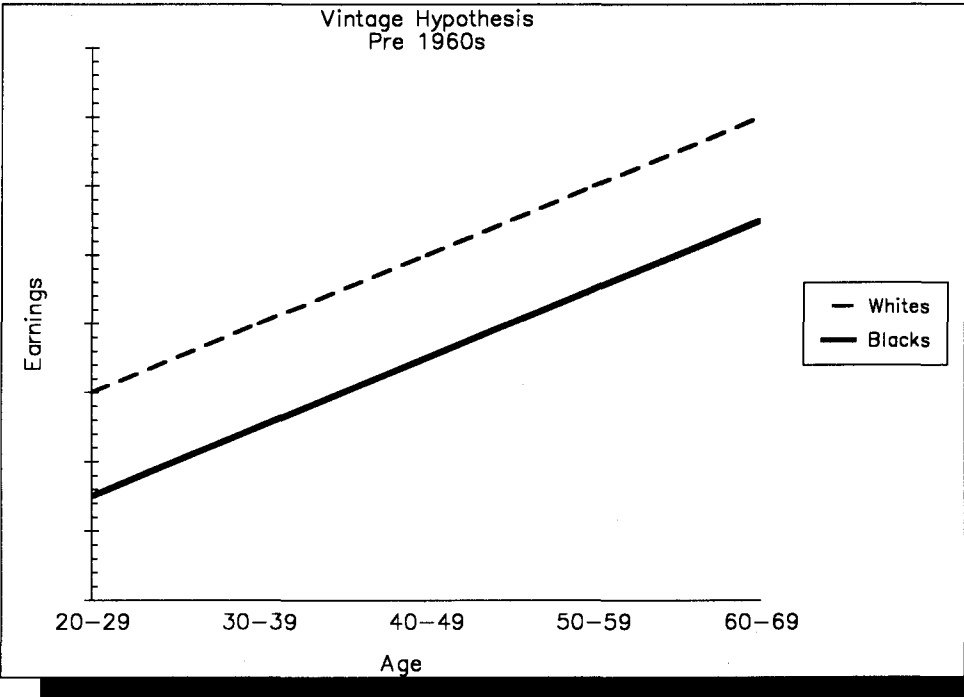


Diagram 3a

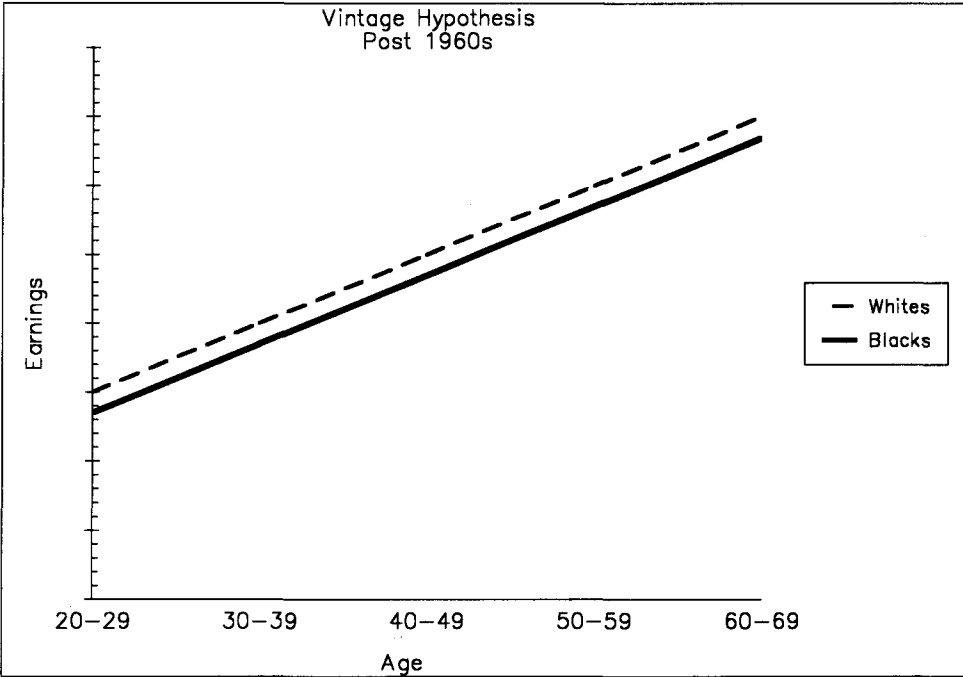


Diagram 3b

then be repeated for the remaining birth cohorts (e.g., those who were 20-29 in 1950), with particular attention being given to those aging effects that were consistently replicated across the different birth cohorts.

*Period effects* can be determined by comparing the same age category at one point in time with that same age category at another point in time (i.e., by reading across the rows). This allows one to compare, for example, the earnings of those age 30-39 in 1950 with those age 30-39 in 1960, and to compare them both with those age 30-39 in 1970. Here again, greater attention would be given to those period effects that were consistently replicated across all age groups.

Finally, *cohort membership effects* can be determined by examining *intercohort* changes (i.e., by reading down the columns). This, for example, allows a comparison of the earnings of those age 30-39 in 1950 with those age 20-29, 40-49, 50-59, and 60-69 in 1950. Once again, greater attention would be given to those cohort effects that were consistently replicated across all periods. An alternative to constructing standard cohort tables involves graphing the relationships. Using the same substantive example discussed above, the graphic method would place the dependent variable (in this case earnings) on the Y axis, and the year of measurement on the X axis. The values for each cohort (i.e., the diagonal strings obtained by reading down and to the right) would then be plotted (using distinguishing symbols) and labeled. If there were no age, period, or cohort effects occurring, only one flat line would appear in the graph. If only cohort effects were operative, parallel flat lines would be observed. If only aging effects existed, parallel slopes would be seen. And finally, if only period effects were occurring, a single jagged line would be found.

As simple as it may seem, the interpretation of age, period, and cohort effects in standard cohort tables and graphs is actually rather difficult. In particular, the problem of statistical confounding (i.e., the identification problem) remains a complication in cohort analysis. Statistical confounding results from the fact that there is a linear dependency in which the basic effects of two factors (i.e., age and period, or age and cohort, or period and cohort) are both involved in each diagonal, row, or column comparison (Glenn 1977). For example, age and cohort effects are represented in column comparisons because the cohorts to be compared have attained different ages. Similarly, cohort and period effects are apparent in row comparisons because different birth cohorts are being compared at different points in history. And age and period effects are involved in diagonal comparisons because the cohorts not only age, they age into new historical periods. Thus, the separation of age, period, and cohort effects by visual inspection of standard cohort tables is difficult unless the observed effects are both pronounced and consistent across all comparisons. For this reason, the interpretation of standard cohort tables is seldom completely straightforward and without ambiguity. Some magnitude of age and period and cohort effects is to be expected.

Work has been done to develop statistical techniques to overcome the limitations of cohort analysis (e.g., Schaie 1965; Baltes 1968; Fienberg and Mason 1978; Smith, Mason, and Fienberg 1982; Mason and Fienberg 1984; and Wolinsky 1990). The "accounting framework" of Mason and his colleagues essentially employs a multiple classification analysis framework. Here the dependent variable, for example earnings, is predicted by a set of dummy (binary) variables representing the age, period, and cohort effects. Expressed in mathematical notation in Equation 1, this approach takes the following form:

$$Y = k + \sum_{i=1}^{I-1} a_i A_i + \sum_{j=1}^{J-1} p_j P_j + \sum_{k=1}^{K-1} c_k C_k + e \quad (1)$$

where  $Y$  is earnings;  $k$  is the intercept;  $A$  is the set of dummy variables representing the age categories and the  $a_i$  are their regression coefficients;  $P$  is the set of dummy variables representing the different periods and the  $p_j$  are their regression coefficients;  $C$  is the set of dummy



variables representing the various birth cohorts and the  $ck$  are their regression coefficients; and  $e$  is the error term.

Notice that this approach begins by omitting one dummy variable from each of the age, period, and cohort parent terms. As a consequence, Equation 1 remains underidentified and cannot be estimated. It is at this point that Mason et al. (1973) introduce two statistical restrictions involved in their accounting framework: The first restriction is that one additional dummy variable must also be omitted. Equation 2 presents an example of such a restriction in which the additional dummy variable is omitted from the set of variables representing the age categories:

$$Y = k + d \sum_{i=1}^{I-2} aiai + d \sum_{j=1}^{J-1} pj pj + d \sum_{k=1}^{K-1} ckck + e \quad (2)$$

Here, it is assumed that two of the age categories will have equivalent behaviors (i.e., that there is no difference between them, all other things being equal).

The second statistical restriction that must be made in order for Equation 2 to work is that the effects of age, period, and cohort must only be additive. That is, the effects of each must be consistent (though not necessarily linear) throughout the range of the others.

If both of these statistical restrictions can be made, then the accounting framework will succeed in separating the effects of age, period, and cohort. Unfortunately, there is much debate about whether these restrictions are realistic, and about the problems of implementing them (e.g., Glenn 1976, 1977, 1989; and Palmore 1978). Clearly, the well-documented relationship between earnings and age do not conform to these assumptions. For this reason, we chose not to rely on what we considered to be the unrealistic assumptions and restrictions of the accounting framework. Rather, we relied on a more general multiple classification analysis, a graphical analytical framework, and clearly stated predictions from the competing theoretical models to guide our data analysis and interpretations of the patterns in the data.

There is general consensus that the only way ultimately to resolve the identification or statistical confounding problem is through sound theory (Glenn 1989). The cohort analyst must, therefore, rely on theoretical (and not strictly statistical) grounds to explain the general (i.e., the additive or main) effects of age, period, or cohort. The importance of identifying those theoretical grounds before the visual inspection of the tables cannot be emphasized enough. Although this a priori reliance on theory is no different from that involved in any form of analysis (Mason and Fienberg 1984), the complexity of cohort analysis makes it all the more important (Glenn 1989). For this reason, we use the three perspectives outlined above to guide our analysis and interpretations of the results: As mentioned previously, the legacy of past discrimination explanation parallels a period effects-driven model; the cumulative effect of discrimination explanation is analogous to an age effects-driven model; and the vintage hypothesis is equivalent to a cohort effects-driven model.

Data and Methods

The data for this study come from two sources: the Current Population Survey's Annual Demographic File (March) for 1990 and the United States Microdata Extract File, 1940-1980: The Demographics of Aging. This study includes only those male respondents between the ages of 20 and 69 who were in the labor force and worked for money the previous year.<sup>2</sup> The above criteria yielded a sample size of 36,850 valid cases (30,956 whites and 5,894

2. Because levels of labor force participation among black males tend to be lower than those for white males, an analysis based only on labor force participants (who presumably have higher earnings than non-participants) will provide a conservative estimate of the black-white earnings disparity.

blacks).<sup>3</sup> The dependent variable in this study is personal earnings in the previous year. Independent variables in the analysis include race (coded 1 for whites and 2 for blacks), age, occupational status (last year), industrial sector, employment status (coded 1 for self-employed, 0 for not self-employed), years of education (coded 0 through 20 for actual years of education),<sup>4</sup> region (coded 1 for Northeast, 2 for Midwest, 3 for South, and 4 for West), city (coded 1 for city residence, 0 for non-city residence), hours worked per week (average last year) and weeks worked last year. Age is grouped for the analysis as follows: 1) 20-29; 2) 30-39; 3) 40-49; 4) 50-59 and; 5) 60-69. The occupational categories used in each year examined differ from each other slightly; however, for this analysis, they have been grouped as follows: 1) professional, managers, technical, and proprietors; 2) administrative support and sales; 3) craftspeople; 4) service; 5) operatives, fabricators, and laborers; and 6) farming.

Consistent with the idea of labor market segmentation, job industrial classifications were grouped into core, peripheral, and government industrial sectors using a system developed by Beck, Horan, and Tolbert (1978). Core industries (coded 1) include most durable goods manufacturers, mining, utilities, transportation, and wholesale trades. Peripheral (coded 2) industries include most nondurable goods manufacturers, retail sales, entertainment industries, and personal services. Unlike Beck and his associates (1978) we have maintained as a separate category the government sector (coded 3), which includes jobs in federal, state, and local agencies.

We used the regression-based Multiple Classification Analysis (MCA)<sup>5</sup> statistical procedure to analyze the data for each year in this study (i.e., 1940, 1950, 1960, 1970, 1980, and 1990). We used earnings as the dependent variable, and we used race, age, occupational status, years of education, industrial sector, employment status, city, region, hours worked per week, and weeks worked last year as independent variables. In the cross-sectional analysis, in each year, we used MCA to compute the unadjusted and adjusted mean earnings of blacks and whites across the five age groups while controlling for the other independent variables (see Andrews, Morgan, and Sonquist 1973). The adjusted means can be interpreted as the expected means if blacks and whites were identical on all of the independent variables. The difference between blacks' and whites' adjusted means is the net race effect after all other independent variables have been taken into account. The difference, therefore, is the net "cost" of being black as opposed to being white in actual earnings. In the synthetic cohort analysis, we examined the unadjusted and adjusted mean earnings of blacks and whites for each cohort over the years studied. We identified five age cohorts: Cohort A was in the 20-29 age group in 1940 and would be in the 60-69 age category in 1980. Cohort B was in the 20-29 age group in 1950 and would be in the 60-69 age group in 1990. Cohort C was in the 20-29 age group in 1960 and would be in the 50-59 age group in 1990. Cohort D was in the 20-29 age group in 1970 and would be in the 40-49 age group in 1990. Cohort E was in the 20-29 age group in 1980 and would be in the 30-39 age group in 1990.

3. Blacks were over-sampled in the United States Microdata Extract File, 1940-1980: The Demographics of Aging Study.

4. While this analysis does not employ an indicator of quality of education, it should be noted that neither have many of the proponents of the vintage hypothesis (e.g., Welch 1973, 1975; and Smith and Welch 1977). Instead, these formulations have assumed that school quality was poorer for older vintages, especially for blacks (see Hoffman 1979 for an elaboration of this point).

5. MCA can be considered the equivalent of regression analysis using dummy variables (Andrews, Morgan, and Sonquist 1973). However, MCA is more convenient than dummy regression analysis because: 1) there is no need to recode all of the independent variables into sets of dummy variables; 2) the coefficients for *all* categories are expressed as deviations from the mean rather than from some unknown "reference" category; 3) MCA does not suffer from the problem of multicollinearity; and, 4) MCA treats each category of the independent variable in a way that is similar to how a dummy variable is treated in a regression analysis. Therefore, nominal, ordinal, and interval scale variables are appropriate as independent variables in the analysis. See Andrews, Morgan, and Sonquist (1973) for a more detailed discussion of MCA.

Findings

Cross-Sectional Analysis, 1940-1990

Table 1 presents the unadjusted mean earnings for blacks and whites for the five age groups in each of the surveyed years, and Figure 1 illustrates these patterns. As Figure 1 shows, in all years except 1940, the youngest blacks (20-29) had unadjusted mean earnings closer to their white age mates than blacks in any other age group. In fact, the percentage

Table 1 • Unadjusted Mean Earnings of Black and White Males by Age, 1940-1990

	1940	1950	1960	1970	1980	1990
Whites 20-29	\$1,177	\$2,621	\$4,601	\$7,502	\$14,729	\$21,735
Blacks 20-29	\$421	\$1,951	\$3,043	\$5,635	\$12,634	\$18,646
Black % of White	35.8%	74.4%	66.1%	75.1%	85.8%	85.8%
Whites 30-39	\$1,582	\$3,476	\$6,211	\$10,576	\$20,528	\$31,443
Blacks 30-39	\$600	\$2,157	\$3,666	\$6,558	\$15,079	\$23,683
Black % of White	37.9%	62.1%	59.0%	62.0%	73.5%	75.3%
Whites 40-49	\$1,677	\$3,733	\$6,224	\$10,444	\$23,175	\$36,300
Blacks 40-49	\$672	\$2,150	\$3,170	\$6,618	\$15,089	\$26,788
Black % of White	40.1%	57.6%	50.9%	63.4%	65.1%	73.8%
Whites 50-59	\$1,562	\$3,410	\$6,138	\$9,805	\$20,732	\$34,595
Blacks 50-59	\$625	\$2,049	\$2,946	\$5,691	\$14,343	\$25,684
Black % of White	40.0%	60.1%	48.0%	58.0%	69.2%	74.2%
Whites 60-69	\$1,452	\$3,003	\$4,825	\$8,266	\$17,458	\$28,689
Blacks 60-69	\$522	\$1,713	\$2,648	\$4,379	\$11,688	\$21,371
Black % of White	35.9%	57.1%	54.9%	53.0%	66.9%	74.5%

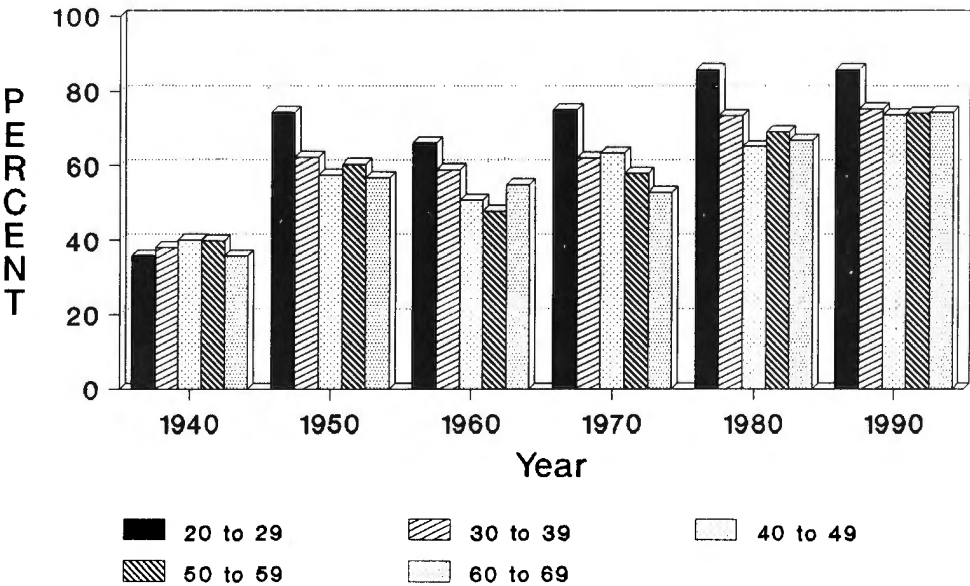


Figure 1 • Percent of Black to White Unadjusted Mean Earnings by Age, 1940-1990

**Table 2 • Multiple Classification Analysis Models Predicting Black and White Males' Earnings by Age and Decade, Net of Other Determinants of Earnings, 1940-1990<sup>a</sup>**

<i>Independent Variables</i>	<i>1940</i>	<i>1950</i>	<i>1960</i>	<i>1970</i>	<i>1980</i>	<i>1990</i>
Grand Means:	1121.86	2730.55	4610.58	8030.81	18206.52	30884.16
Race by Age Beta <sup>b</sup> :	.21**	.27**	.25**	.18**	.19**	.19**
Whites 20-29	-135.49	-497.82	-798.33	-1504.39	-4662.25	-7220.29
Blacks 20-29	-298.44	-574.85	-1019.94	-1675.17	-4112.31	-8149.37
Whites 30-39	126.15	328.77	586.10	1049.65	15.58	-516.74
Blacks 30-39	-180.92	-316.61	-684.52	-934.36	-2150.68	-4578.64
Whites 40-49	251.35	607.73	1046.37	1375.55	2578.34	3353.71
Blacks 40-49	-160.63	-310.04	-634.81	-627.90	-1619.74	-1216.97
Whites 50-59	232.67	479.78	1012.79	966.10	2179.99	3932.52
Blacks 50-59	-203.21	-293.96	-618.96	-624.32	-315.12	200.39
Whites 60-69	103.87	237.88	79.86	-115.78	-301.95	1215.57
Blacks 60-69	-222.63	-503.38	-864.09	-952.52	-846.55	-1513.57
Occupation Beta:	.32**	.27**	.25**	.22**	.20**	.20**
Professional	728.69	1050.04	1696.97	2347.45	3454.71	5499.45
Administrative	173.52	118.90	22.68	-192.37	-24.99	-556.15
Crafts	139.26	118.44	83.28	-162.85	-57.16	-1319.77
Service	-251.64	-484.37	-942.88	-1477.31	-3862.09	-5967.14
Operatives	-122.97	-172.51	-313.84	-643.89	-1467.06	-3366.66
Farm	-304.22	-450.52	-1102.23	-1693.52	-2679.02	-8422.77
Sector Beta:	.11**	.08**	.08**	.09**	.08**	.10**
Core	78.65	95.49	176.53	337.99	621.92	1417.41
Periphery	-112.75	-174.50	-375.16	-813.50	-1549.39	-2989.63
Government	203.67	-42.07	-231.03	329.84	-274.29	124.86
Region Beta:	.11**	.11**	.12**	.14**	.06**	.08**
Northeast	149.87	6.26	191.98	774.32	243.82	2935.93
Midwest	30.53	155.81	387.55	403.16	694.13	-780.63
South	-101.99	-252.98	-471.09	-1015.56	-879.74	-1610.28
West	41.86	268.35	430.72	670.31	622.72	56.27
Education	99.08**	130.61**	331.34**	524.27**	991.85**	2525.14**
Hours Per Week	-6.48**	-2.82	14.04*	53.62**	133.91**	223.85**
Weeks Per Year	25.21**	53.57**	78.97**	129.07**	361.98**	631.02**
Self-Employed	-184.21	-356.36	-506.08	4812.41**	5258.22**	911.76**
City	140.61**	-86.52	-127.40	-473.07*	-1541.28**	-240.37
Adjusted R-Square	.541**	.440**	.425**	.341**	.301**	.316**
N	2820	1978	2944	2971	2639	29159

\*\*  $p < .01$  \*  $p < .05$ 

a. Coefficients are unstandardized (dollar amounts). The MCA categorical coefficients are presented as deviations from the grand mean. Coefficients for the covariates are presented as multiple regression coefficients.

b. Beta indicates the ability of the predictor, using all the categories given, to explain variation in the dependent variable (earnings). It is analogous to the correlation coefficient in OLS regression for all of the categories of the independent variable.

drop in black-to-white earnings from the youngest group to the next youngest group was quite dramatic (down 11 percent on average). Young blacks' earnings as a percentage of young whites' earnings were greatest in 1980 (85.8 percent) and 1990 (85.3 percent) followed by 1970 (75.1 percent). Declines in the ratio of black-to-white earnings from the youngest age group to the next youngest age group were greatest in 1970 (-13.1 percent), 1980 (-12.3 percent), and 1950 (-12.3 percent).

There was increasing racial disparity in mean earnings with age—especially in 1990, 1980, 1970, and 1950. This pattern is most consistent with the "cumulative effect of discrimination" perspective of the racial earnings gap. In 1960, however, there was a curvilinear age effect caused by a modest convergence in mean earnings of black and white males in the 60-69 age group.

Table 2 presents the multivariate results from multiple classification analysis models (MCA) predicting the earnings of black and white males by age and year, net of other determinants of earnings. With only one exception, this table shows that blacks in each age category and in each year earned less than their white counterparts, net of the other correlates of earnings. Moreover, the negative coefficients also suggest that virtually all age groups of blacks in every year (except 50-59 in 1990) received less than average earnings. This is in contrast to the pattern for whites, where only the youngest respondents and the oldest respondents from 1970-1990 had earnings that were below average. More critical for the three theoretical models at hand, however, is the fact that for each year, the black-white earnings gap increased with age (until the oldest age group). This point is illustrated more clearly in Table 3 and in Figure 2. Again, these patterns are most consistent with the cumulative effect of discrimination perspective.

Table 2 also shows that other factors in the model were also related to earnings. For each year, occupation evidenced a pattern in which professionals attained the highest earnings, followed by administrators, craftsmen, operatives, service workers, and farm workers respectively. The results also show that workers in the core sector had greater earnings than those in the government sector, with those in the periphery earning the least on average. Regional differences varied by year, but respondents in the South consistently had the lowest earnings. The results also show earnings generally increased as education increased, as number of work hours per week increased, as number of work weeks per year increased, when one was self-employed, and when one lived outside the city. In each model, the independent factors accounted for more than 30 percent but less than 55 percent of the variance in earnings.

Table 3 summarizes the results from the MCA, and Figure 2 graphically depicts the mean earnings of blacks as a percentage of white mean earnings by age for each year examined. Here, the results are presented as adjusted means that again statistically control for other correlates of earnings. These adjusted mean earnings reflect what we would expect black and white males to earn if they were identical in terms of occupation, education, etc. The gap in adjusted mean earnings reflects the negative effect of "being black" on earnings unmediated by the other independent variables in the analysis.

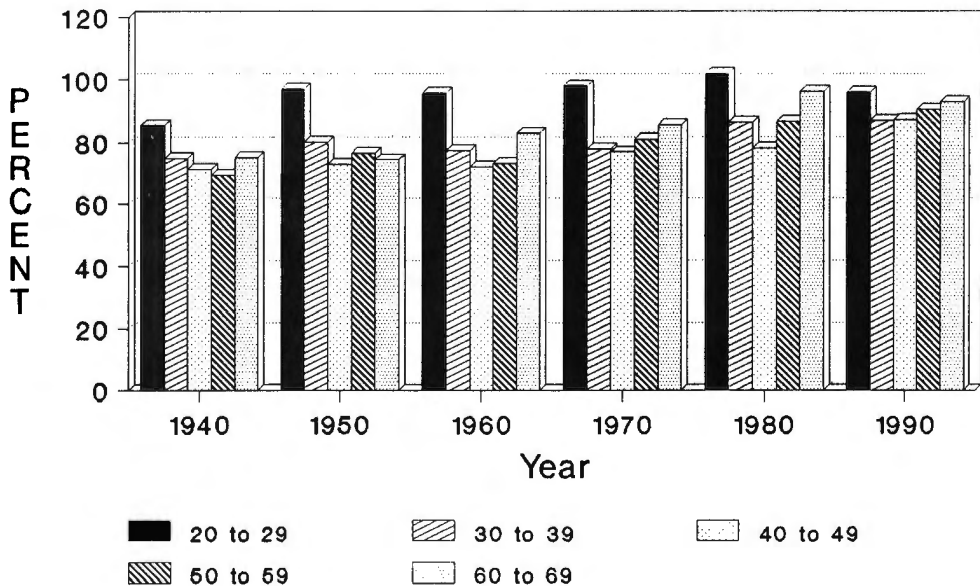
The results show that younger blacks were again closer to their white counterparts than were older blacks to their white peers. As Figure 2 shows, blacks in the 20-29 age group had adjusted mean earnings that were closer to their white age equals than blacks in other age groups in all of the years. There was also a significant increase in the racial gap between the youngest to second youngest age groups in every year examined. The black-white earnings gap increased between ages 30-39 and 40-49 in all years except 1970 and 1990. However, there was a narrowing of the racial gap for the oldest age category. This again suggests that the effect of age on the net racial disparity was curvilinear. Younger blacks in each year (including 1940) were closer to their white counterparts. The racial gap then widened significantly for the middle-aged, but narrowed again for the older age categories in all years except 1950.

### *Cohort Analysis*

If the effect of aging on the racial gap in earnings is curvilinear, as suggested by the cross-sectional analysis, this should be reflected in the age cohorts as they move over time. Figure 3 illustrates blacks' unadjusted mean earnings as a percentage of whites' unadjusted mean earnings for Cohorts A through E (presented in Table 1). As Figure 3 illustrates, the black-to-white earnings ratios for Cohorts B through E were highest for the youngest age group. But for each cohort, they declined significantly when workers reached the 30-39 age point. For Cohort A, the racial gap in unadjusted mean earnings decreased between ages 20-29 (in 1940) to ages 30-39 (in 1950), but increased at age 40-49 (in 1960). For Cohorts A through

**Table 3 • Adjusted Mean Earnings of Black and White Males by Age, 1940-1990**

	1940	1950	1960	1970	1980	1990
Whites 20-29	\$986	\$2,233	\$3,812	\$6,526	\$13,544	\$23,664
Blacks 20-29	\$823	\$2,156	\$3,591	\$6,356	\$14,094	\$22,735
Black % of White	83.5%	96.5%	94.2%	97.4%	104.1%	96.1%
Whites 30-39	\$1,248	\$3,059	\$5,197	\$9,080	\$18,222	\$30,367
Blacks 30-39	\$941	\$2,414	\$3,926	\$7,096	\$16,056	\$26,306
Black % of White	75.4%	78.9%	75.5%	78.2%	88.1%	86.6%
Whites 40-49	\$1,373	\$3,338	\$5,657	\$9,406	\$20,785	\$34,238
Blacks 40-49	\$961	\$2,421	\$3,976	\$7,403	\$16,587	\$29,667
Black % of White	70.0%	72.5%	70.3%	78.7%	79.8%	86.7%
Whites 50-59	\$1,355	\$3,210	\$5,623	\$8,997	\$20,387	\$34,817
Blacks 50-59	\$919	\$2,437	\$3,992	\$7,406	\$17,891	\$31,085
Black % of White	67.8%	75.9%	71.0%	82.3%	87.8%	89.3%
Whites 60-69	\$1,226	\$2,968	\$4,690	\$7,915	\$17,905	\$32,100
Blacks 60-69	\$899	\$2,227	\$3,746	\$7,078	\$17,360	\$29,371
Black % of White	73.4%	75.0%	79.9%	89.4%	97.0%	91.5%

**Figure 2 • Percent of Black to White Adjusted Mean Earnings by Age, 1940-1990**

C, there was a modest trend toward convergence of black and white unadjusted mean earnings at the older age points.

Figure 4 charts black-to-white earnings for the five cohorts, controlling for the independent variables in this study (as presented in Tables 2 and 3). As with the cross-sectional portion of the study, controlling for these variables increases the curvilinear effect of aging on the racial gap in earnings. In all five cohorts, there was a widening of the racial gap in adjusted mean earnings between ages 20-29 and 30-39. This widening was particularly dramatic for Cohorts B through E. The convergence in adjusted mean earnings for older blacks and whites was also evident after controls.

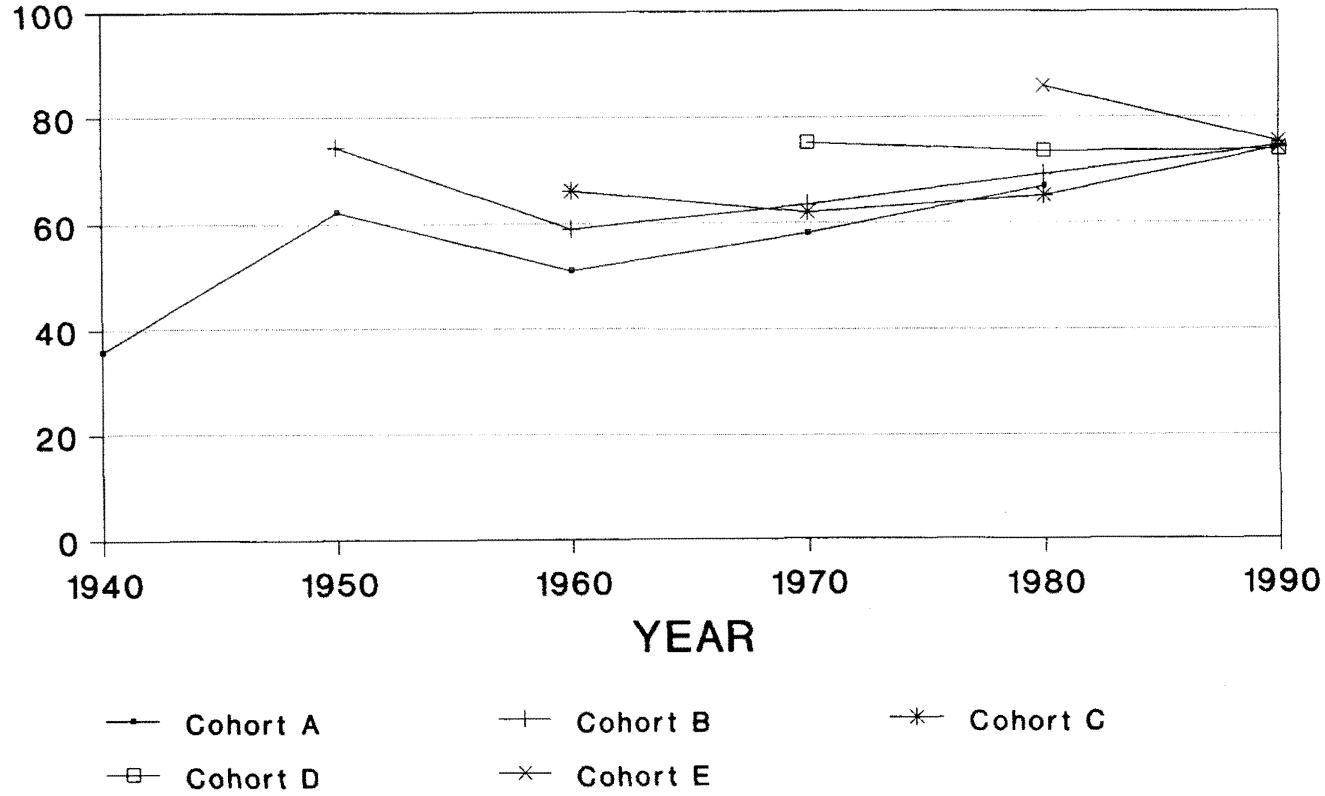
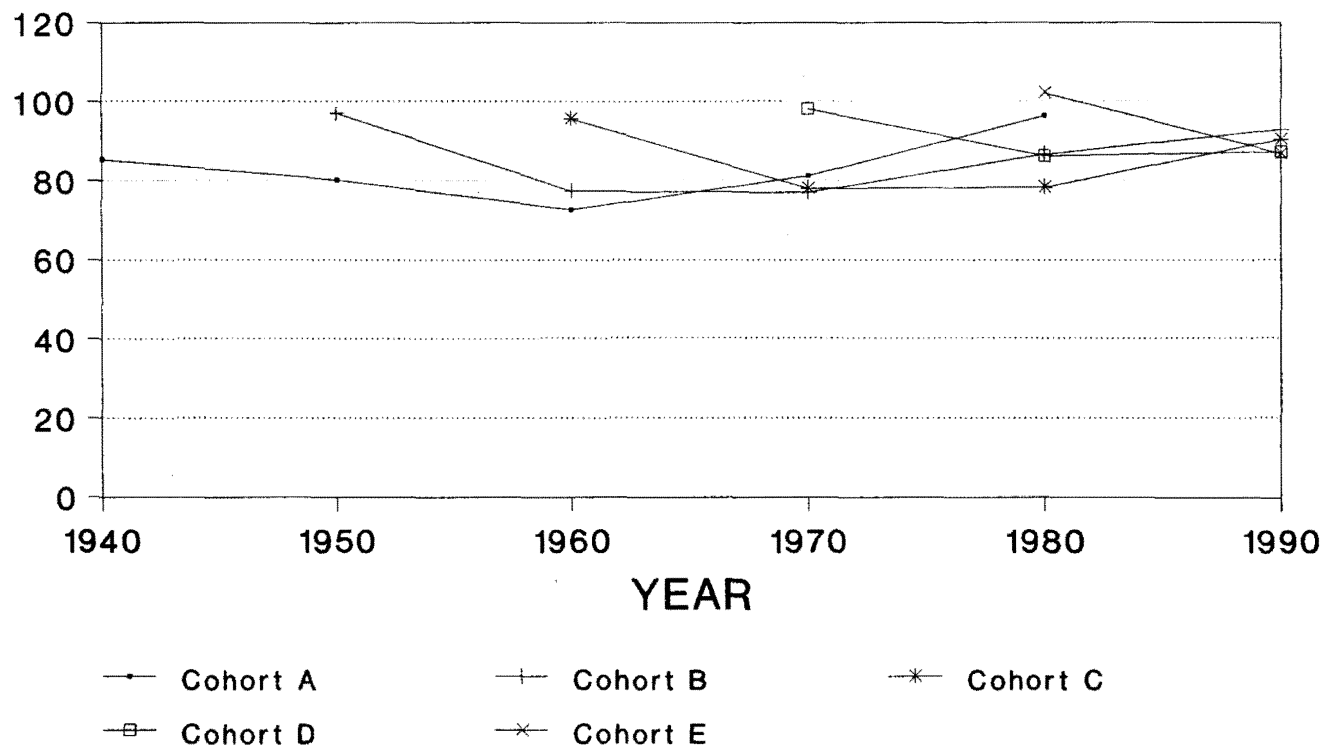


Figure 3 • Black Male Percentage of White Male Mean Earnings For Five Age Cohorts



**Figure 4 • Black Male Percentage of White Male Adjusted Mean Earnings For Five Age Cohorts**



An important finding is the dramatic decline in black earnings compared with those for whites from the youngest age category (20-29 years) to the next (30-39 years). This decline is consistent for every period and cohort (see Tables 2 and 3). This result is similar to those reported in prior studies (Farley 1984; Farley and Allen 1987; Thomas and Horton 1992; Thomas 1993). At the youngest age category, both blacks and whites are likely to hold low-paying jobs because of their lack of work experience. However, as they move into their 30s an important divergence occurs. Whites begin to gain not only from the amount of time spent in the labor force, but from the absence of the barriers that limit opportunities for blacks (Duncan 1968; Lieberman 1980). Similar findings have been noted in studies of self-employment and other indicators of well-being (Horton and DeJong 1991; Horton 1992). In essence, blacks historically have been prevented from maximizing their human capital relative to whites (Franklin and Moss 1988), and this pattern persists over time and the life course (Thomas 1993).

These results are consistent with the cumulative effects of discrimination explanation, as the black-white earnings gap did become progressively larger for each cohort as they moved through the life cycle. Not consistent with this model (nor any other), however, is the finding that there were uniform patterns of black-white earnings convergence for each cohort after their "prime earnings age" (after age 50). This racial convergence in earnings in the later years may be a reflection of reduced work effort by white males who have more wealth built up than black males, have other sources of income besides earnings, and have entered retirement and semi-retirement. As Tables 1-3 show, the convergence of earnings between older blacks and whites was caused by the drop in earnings between ages 50-59 and 60-69 that was more dramatic for whites than for blacks. That is, the earnings of older blacks did not improve and become similar to those of older whites; rather, the earnings of older whites declined sharply and became more similar to those of older blacks.<sup>6</sup>

## Discussion and Conclusions

The "legacy of past discrimination" explanation for the continuing racial disparity in earnings receives no support from the cohort analysis presented here. Younger blacks were better off than middle-aged blacks compared with their white counterparts in all of the years analyzed. This was not due to their being able to take advantage of newly developed opportunities but to their position in the life cycle. Therefore, according to the projections of the cohort analysis, within the next 10 years the earnings of blacks in the youngest age groups will fall dramatically behind their white counterparts and will remain behind for the next 10 to 20 years. However, when they become elderly, their earnings will "catch up," due to more sharply declining white earnings.

The results provide little in the way of support for the vintage hypothesis. The net black-white earnings gap was not constant over time nor over the life cycle. Indeed, the results suggest that such disparities grew and then declined within cohorts.

The study provides some confirmation of the cumulative discrimination over the life course thesis. While the negative effects of race on black males did increase as they moved into the middle life stages, the racial effects decreased as black males moved into the senior life stages. It is important to note that blacks in the 30 to 50 age group are in their "prime" in terms of raising children, establishing careers, and building wealth. This analysis suggests that it is black males in this age range who were the most disadvantaged in terms of earnings.

Our analysis also shows a pattern that was unanticipated by any of the models: There was a convergence of the earnings of black and white males in the upper age groups. It is

6. In other analyses not presented here, the above analysis was repeated for college educated and non-college educated subsamples. Neither subsample differed significantly from the pattern found in the overall sample.

likely that wage earnings become more similar at this stage in the life cycle because elderly white males begin to depend more on accumulated wealth than their black counterparts. Studies have shown that racial inequality in wealth is much greater than racial inequality in earnings and income (e.g., Oliver and Shapiro 1989). Elderly white males may, therefore, de-emphasize earnings from employment because of earnings from income-producing assets. Black elderly males, on the other hand, may have to work longer due to inadequate retirement benefits. Because of this, there may be a selection bias involving older white males who are still in the labor force. More affluent whites can perhaps afford to retire earlier (in their late 50s to mid-60s) if they choose, and thus not be included in this study. This would leave behind those less affluent whites still in the labor force who could not afford the luxury of early retirement—a situation they would share with their black counterparts. This could account for the convergence between black and white earnings in the 60-69 age group.<sup>7</sup>

The empirical findings allude to a cogent explanation of why young blacks relative to young whites would have small earnings differences while older blacks relative to older whites would have larger ones: Labor market dynamics are not guided by pure rationality and perfect competition; rather, a number of concrete processes operate systematically to generate differential remuneration for blacks and whites. For example, segmented labor markets offer qualitatively different jobs (Cain 1976; Beck, Horan, and Tolbert 1978; Dickens and Lang 1988; and Lichter 1988). Positions in the primary labor market offer relatively high pay, good benefits, job security, and the possibility for on-the-job advancement; jobs in the secondary labor market offer relatively low pay, poor benefits, seasonal or contingent employment, and little upward mobility on the job. Blacks are under-represented in the primary labor market and over-represented in the secondary labor market (Lichter 1988). In addition, normative beliefs about “black jobs” and “white jobs” (Neckerman and Kirschenman 1991), employer reliance on “soft skills” rather than tangible ones (Kirschenman 1992), informal recruitment networks (Braddock and McPartland 1987), employers’ “tastes for discrimination,” (Portes and Sassen-Koob 1987; and Neckerman and Kirschenman 1991) and exclusionary practices by labor unions and professional associations (Johnson and Oliver 1992) all act to steer blacks into racially typed jobs in the secondary labor market in lower paying jobs with fewer benefits and opportunities for upward mobility. But more important is the fact that in the secondary labor market, additional years of work experience do not count for much; thus, blacks’ earnings (in the secondary labor market) do not improve much with additional years of experience, and thus they fall farther behind whites’ earnings (in the primary labor market) with each passing year.

In addition to these segmented labor market dynamics, there are also firm-specific practices that come into play. In particular, when young blacks and whites initially begin to work for companies, neither race group has much work-relevant experience. There is, however, a tendency for the same credentials for blacks to result in less access to professional jobs than for whites (Shelton 1985; Landry 1987). Thus, smaller proportions of college-educated blacks occupy positions of authority. So, fewer blacks are able to influence decisions concerning hiring, retention, and promotion of subordinates. Consequently, blacks at different career stages lack the objective sponsorship of their white counterparts. Moreover, as they age, the structure of employment within firms is more likely to inhibit the upward mobility of blacks. As Collins (1989) points out, blacks in managerial positions are given fewer opportunities to accrue additional skills and responsibilities to enhance their professional credentials for future rounds of competition. Also, as Johnson and Herring (1989) demonstrate,

7. In other analyses not presented here, whites were found to be more likely to be working than blacks in all age brackets except the 60-69 category. Blacks in the 60-69 age bracket were more likely to be working (50.2 percent) than their white counterparts (46.7 percent). This suggests that whites may be retiring earlier than blacks — probably because it is economically more feasible for them to do so.

individuals who do not experience early career successes are less likely to experience promotions in subsequent years. "Blacks are significantly less likely ever to be promoted. This [tendency] continues to be exacerbated over time" and over the life cycle (Johnson and Herring 1989:22). In addition, blacks and individuals from low socioeconomic backgrounds are more likely to be dismissed from their jobs, especially early in their careers. Again, the career effects of such dismissals persist over the life course (Johnson and Herring 1989). Thus, fewer blacks benefit from the higher earnings and rewards that are associated with promotion and job tenure. These patterns are consistent with the arguments of the cumulative effects of discrimination model.

In sum, this analysis raises anew questions about whether race is declining in its significance in the work place, and whether studies that optimistically point to gains made by younger, more educated blacks are accurate. If history is any predictor, and if current patterns persist, presumed gains made by young black males may in fact turn out to be illusory.

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