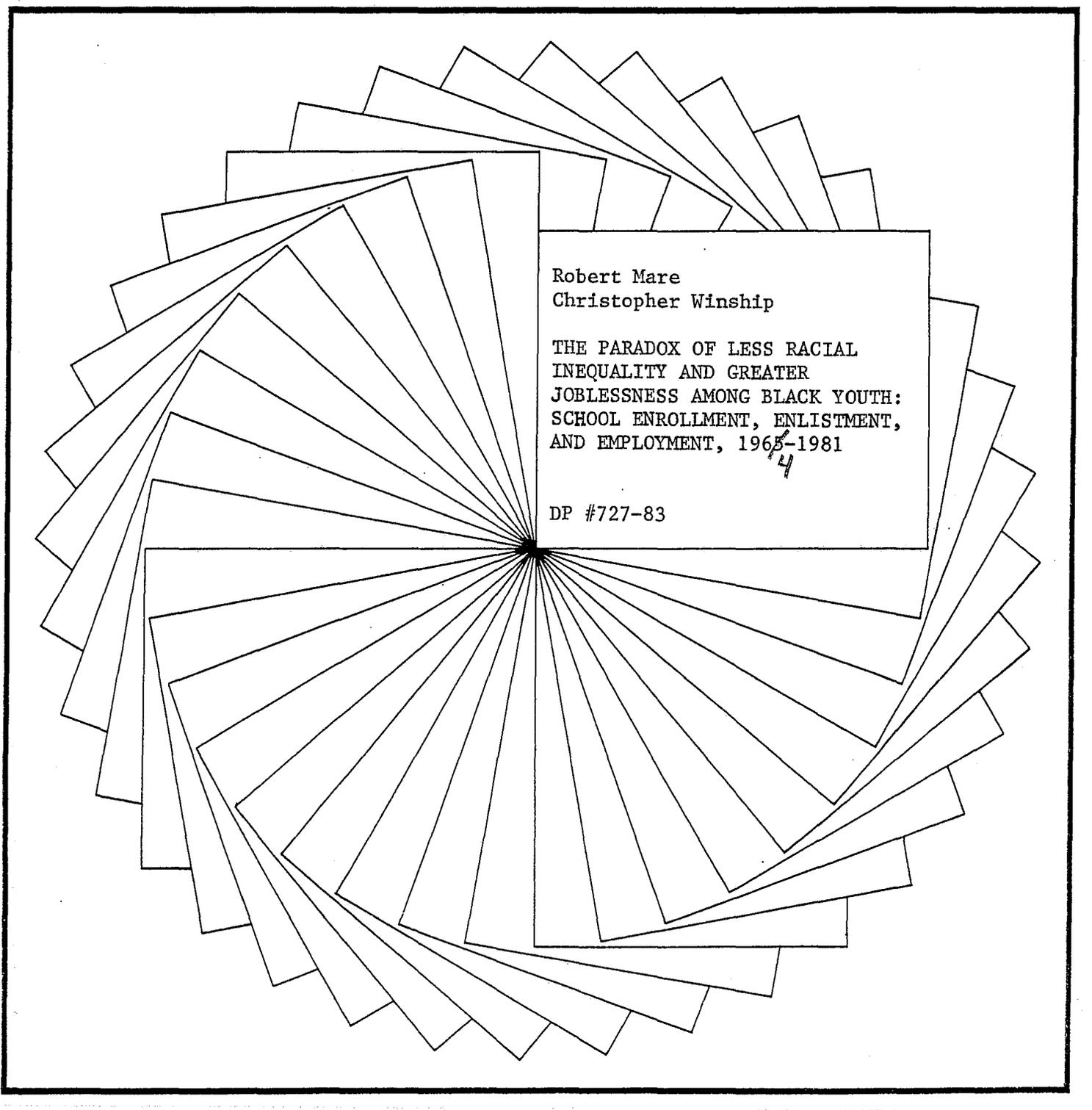

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Robert Mare
Christopher Winship

THE PARADOX OF LESS RACIAL
INEQUALITY AND GREATER
JOBLESSNESS AMONG BLACK YOUTH:
SCHOOL ENROLLMENT, ENLISTMENT,
AND EMPLOYMENT, 196~~5~~⁴-1981

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The Paradox of Less Racial Inequality
and Greater Joblessness Among Black Youth:
School Enrollment, Enlistment, and Employment, 1964-1981

Robert D. Mare
University of Wisconsin

and

Christopher Winship
Northwestern University

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Abstract

An important exception to improvements in the relative socioeconomic status of blacks during recent decades is increased levels of joblessness among black youths relative to whites. Despite the many proposed explanations for this trend, few reconcile worsening employment status for black youths with concomitant improvements in other socioeconomic indicators.

Three mechanisms that link reduced status differences between blacks and whites in other spheres with increased disparity in employment are: (1) increased substitution of schooling and military service for employment by young blacks; (2) reduced work experience and disrupted employment for young blacks at older ages as a result of later average ages upon leaving school and the armed forces; and (3) "creaming" young blacks with above-average employment prospects from the civilian out-of-school population as a result of higher school enrollment and military enlistment rates.

Empirical assessment of these arguments using individual-level annual March Current Population Survey data for 1964-1981 shows that they account for a substantial part of the growing racial employment difference among men aged 16 to 29. The results suggest that race differences in youth employment in the early 1960s were concealed by race differences in rates and timing of school enrollment and military enlistment. Elimination of the latter differences reveals the true size of the race difference in employment. Although racial convergence on school enrollment and educational attainment has reduced other socioeconomic inequalities between the races, it has widened the employment difference.

I. INTRODUCTION

One of the most important changes in American society in recent decades has been the lessening of socioeconomic differences between blacks and whites. Since World War II blacks and whites have converged on many indicators of socioeconomic status, such as grades of school completed, the proportion of workers in managerial and professional occupations, earnings, the quality of schools attended, economic returns to schooling, and numbers of elected officials (e.g., Farley, 1983; Freeman, 1973; 1976). Although views are mixed on whether these changes indicate the permanent break-up of historic patterns of racial inequality in the United States or are mainly short-term results of exceptional economic growth and political effort (e.g., Farley, 1983; Freeman, 1973; Butler and Heckman, 1977; Hill, 1978; Wilson, 1978; Collins, 1983), statistical differences in socioeconomic welfare between the races have unmistakably declined. The pattern of these changes suggests that these reductions in inequality may indeed persist inasmuch as the greatest convergence in indicators of educational and labor market success has occurred for young adults (e.g., Welch, 1973; Smith and Welch, 1978; Freeman, 1973; Farley, 1983).

A key exception to these trends, however, has been divergence between the races in levels of employment and unemployment for teenagers and young adults. Despite stable or converging trends in race differences in joblessness for adult workers and otherwise salutary trends in other socioeconomic indicators for persons under thirty, race differences in proportions of the youth population employed and proportions of the youth labor force unemployed have grown. For example, in 1954 black and

white unemployment rates for 16 to 24 year olds were 15.8 and 9.9 percent respectively, a difference of 5.9 percentage points that grew to 8.7 in 1960 and 12.0 in 1970. In 1980 the rates were 26.4 and 12.0 percent respectively, a difference of 14.4 percentage points. Similarly, the percentage of 16 to 24 year olds who were employed declined for blacks from 47.2 in 1954 to 40.6 in 1980, but increased for whites from 49.7 in 1954 to 62.0 in 1980 (U.S. Department of Labor, 1982). These trends represent a dramatic deterioration in the relative labor market standing of black youths and raise doubts about future convergence of racial socioeconomic trends in the adult labor market when current youth cohorts reach maturity (e.g., Congressional Budget Office, 1982; Freeman and Wise, 1982).

Despite the prominence of these trends, they have not been satisfactorily explained. Many proposed explanations focus on social and economic changes believed to hurt black youths disproportionately: the spread of minimum wage legislation; the rapid growth of the youth population in the aftermath of the postwar baby boom; increased labor market competition among women, immigrants, and youth; unfavorable changes in the job composition and physical location of industry; shortfalls in aggregate demand for labor; and reduced willingness of youths to take low status employment (e.g., Congressional Budget Office, 1982; Osterman, 1980). The importance of these factors has not been determined empirically, although their effects can in many cases be questioned on the grounds that they appear to alter the employment chances of black and white youths alike and leave unaffected the race difference (e.g., Mare and Winship, 1979). More important, whatever the quantitative impact of

these factors, existing accounts of trends in the youth labor force fail to reconcile the deteriorating trend in black youth employment with progress in other socioeconomic indicators for blacks generally and recent black entrants to the labor force in particular.

This paper considers explanations for the changing relative employment status of black and white youths that, at least in part, link this change to other trends more favorable to young blacks. It examines the implications of racial convergence of patterns of movement from schooling and the military to work for trends in relative levels of black and white youth employment. More specifically, it explores the effects of trends in school enrollment and military service on changes in proportions of the races employed among men aged 16 to 29 from 1964 to 1981.

Many factors are related to the high level of joblessness among young persons. The major factor is the competition between work and other activities--e.g., schooling and military service--for the young person's time. Other factors are differences between adults and younger job seekers in educational attainment, work experience, and attractiveness to employers generally; and difficulties youth experience in moving from other activities to full-time participation in the labor force (Freeman and Wise, 1982; Mare, Winship, and Kubitschek, 1982; Osterman, 1980). The postwar period has witnessed significant changes in the distribution and timing of activities for young men; trends which have differed markedly for blacks and whites. Most important, school attendance of blacks has markedly increased over this period as a result of more favorable family backgrounds, improved quality of schools, reduced discrimination by institutions of higher education, and better labor

market incentives. Young blacks now spend more of their time in school and leave school at later ages than in the past. For whites, school enrollment rates grew gradually into the 1960s but have been stable or declining since then. Similarly, trends in military service have differed over this period for blacks and whites. The number of men serving in the armed forces grew from the mid-1950s until reaching a peak during the Vietnam mobilization after which it decreased. The post-Vietnam era, however, has witnessed a reversal of historically higher rates of military enlistment for whites: blacks are now disproportionately represented in the armed forces and among veterans.

Changes in race differences in employment may result in part from changing race differences in the structure and timing of young persons' movement from schooling and the armed forces to work. This paper develops this conjecture by considering three arguments: (1) that young blacks, much more than their white counterparts, are increasingly substituting schooling and military service for work; (2) that leaving school later and increased representation in the recent veteran population have reduced the average number of years of civilian work experience for young blacks; and (3) that because schools and the military retain young persons with better than average employment prospects, employers find less attractive potential employees, on average, in the relatively smaller, out-of-school civilian youth population that remains. We develop these arguments and assess them empirically using data from the March Current Population Surveys (CPS) of 1964 through 1981.

As shown below, these mechanisms account for a substantial part of the broadening race difference in numbers of young persons who are employed. An important feature of our argument is that it reconciles the salutary trend toward educational equality between blacks and whites with broadening employment differences for young men. It shows that past race differences in youth employment were partly concealed by race differences in the transitions from schooling and the military. The elimination of the latter differences reveals substantial and persistent underlying racial inequality in the youth labor market. We illustrate, therefore, the complexity of changes in racial stratification by showing that the elimination of some inequalities reveals or induces others.

II. RELATIONSHIPS AMONG ENROLLMENT, ENLISTMENT, AND EMPLOYMENT TRENDS

Enrollment, Enlistment, and Intracohort Employment Growth

In research reported elsewhere (Mare, Winship, and Kubitschek, 1982), we have examined the effects of school enrollment and military service on employment growth within a cohort's young adulthood (ages 16 to 29). Employment probabilities rise with age in a cohort as young men leave school and the armed forces and seek civilian employment. The mechanisms through which employment rises are threefold. (1) Students work less than nonstudents as a result of the time limits that study places upon work, shortages of part-time jobs compatible with academic schedules, and their access to scholarships and parental support. Since the proportion of a cohort enrolled in school declines with age, the proportion employed rises as the temporal and financial disincentives to

work disappear. (2) Those who have recently left school and veterans experience high rates of joblessness because they lack work experience and change jobs often as they and their employers attempt to find a satisfactory match (Lazear, 1977; Osterman, 1980). As a cohort ages, the proportion of men in the vulnerable stage of having recently left school or the armed forces declines, thereby raising average employment probabilities.

(3) The age pattern of employment for out-of-school civilians mirrors the timing of departure from school and the armed forces of men whose employment prospects are best. As a cohort ages from its mid-teens onward, the average educational qualifications of persons newly leaving school rise. Because factors that bode well for labor market success also bode well for academic success, persons leaving school later also tend to have more advantageous family backgrounds, higher levels of measured ability, and attributes generally more attractive to potential employers than their counterparts who drop out earlier. Thus as a cohort ages, its out-of-school population is increasingly made up of individuals with the best employment prospects, thereby increasing the proportion of the cohort that is employed. With regard to the armed forces, enlistees typically have average education, family background, and ability, but above-average civilian employment probabilities because unemployment is concentrated among the least educated, least able, and least advantaged. Paralleling the effects of the timing of school attrition, the influx of relatively capable enlistees into the civilian labor force in a cohort's late twenties raises cohort employment rates. Taken together, the competitive, disruptive, and selective effects of schools and the military account for approximately 80 percent of the difference in proportions

employed at age 30 and age 16 for recent cohorts of American men (Mare, Winship, and Kubitschek, 1982).

Changing Competition of Schooling and Military

As noted above, age-specific rates of school enrollment have increased markedly for young blacks, whereas they have increased more slowly or declined for whites. Because students work less than nonstudents, enrollment trends have significantly reduced the proportion of young blacks who are employed and raised or held stable the proportion for whites. The effects of enlistment on employment are largely definitional. If men serving in the armed forces are regarded as not employed, increasing participation in the armed forces by young black men relative to whites accounts in part for blacks' reduced relative levels of civilian employment. Conversely, if those serving in the armed forces are defined as employed (National Commission on Employment and Unemployment Statistics, 1979), the worsening relative employment status of young black men is overstated.

Changing Patterns of Movement from Schooling and the Armed Forces to Work

As black school enrollment rates have risen, at any age the proportion of young out-of-school blacks who are "recent school leavers" has increased. In the past, typical black 20-year-olds, for example, were out of school for several years, whereas now that age group now includes many more persons who have been out of school less than two years. Conversely, if whites are not leaving school any later, they experience no reductions in age-specific average levels of work experience and no

increases in fraction of young men newly out of school. New veterans experience similar or higher rates of joblessness compared to recent school leavers. Because young blacks are now overrepresented in the armed forces and among young veterans, they experience declining relative employment levels.

Changing Selectivity of Schools and the Armed Forces

As enrollment and enlistment rates change over time, the proportion of the out-of-school civilians who are employed may change in response to the varying degree to which schools and the armed forces "cream" young men with above-average employment prospects. For young blacks, increases in rates of school enrollment may have removed from the out-of-school population young men who in past years would not have attended school but would have been relatively successful in securing employment (in comparison to men with characteristics leading them to leave school early in all years). For whites, in contrast, to the extent that school enrollment rates have declined somewhat in recent years for some age groups, employment among out-of-school men may have increased because of the greater attractiveness to employers of those men who in earlier years would have attended school. Similarly, as blacks have moved from being underrepresented to overrepresented in the military, the degree to which the military selects men with above-average employment prospects has become greater for blacks than for whites.

The Effects of Trends in Grades of School Completed

The above arguments are not to gainsay the positive effects of rising black educational attainment on employment. Employment chances

vary directly with grades of school completed (e.g., Feldstein and Ellwood, 1982; Nickell, 1979). That black employment has fallen relative to that of whites despite racial convergence in grades of school completed suggests that, in the absence of the latter trend, the black-white employment gap would have grown even more. Thus, trends in grades of school completed and the trends in school enrollment rates that underlie them may have offsetting effects on employment trends.

III. DATA

We use public-use data files from the March Current Population Surveys (CPS) for the years 1964 through 1981 and unpublished Department of Defense (DOD) tabulations for the third quarter of each year. From the CPS, we select civilian noninstitutional men aged 16-29, a total of 260,840 observations. The number of independent observations, however, is approximately 50 percent of this because the rotation group structure of the CPS dictates that one-half of its housing units are visited in the same month one year later (U.S. Bureau of the Census, 1978). The CPS, moreover, is a multi-stage, stratified cluster sample. Thus the assumption of simple random sampling, made in the multivariate analyses reported here, is not met. Because reported test statistics do not allow for the nonrandomness of the CPS samples, the statistical significance of estimated parameters is typically overstated. The DOD tables are of age by race for the period 1964-1971 and of age by race by grades of school completed for the period 1972-1981. They are deflated by the approximate CPS sampling fractions, although they are based on a census of the armed forces.

To reduce the computational burden, the CPS data are grouped into a table with the following dimensions: (1) Employment status (employed, not employed); (2) Schooling (less than 12, 12, more than 12 grades); (3) Age (7 two-year categories from 16 through 29); (4) Race (nonblack, black); (5) Veteran Status (nonveteran, veteran); (6) Enrollment/Years Out of School Status (enrolled, first year out of school, second or third year out, fourth year or more out); (7) Survey Year (1964,...,1981). Enrollment status is ascertained from the "major activity" item in the March CPS, which identifies persons spending most of their time at school.¹ Years out of school is estimated from age and highest grade of school completed.² Age is parameterized as having a linear effect within age intervals (16-19, 20-23, 24-29).

IV. STATISTICAL METHODS

The multivariate analyses include single-equation probit models that predict whether an individual is employed (d_y) and two-equation probit models that jointly predict employment for out-of-school men and whether or not an individual is in the not-enrolled civilian population. In the single-equation model, an individual's probability of employment is nonlinearly related to the independent variables. For the i th individual,

$$p(d_{y_i} = 1) = \int_{-\infty}^{c_{y_i}} \frac{1}{\sqrt{2\pi}} \exp\left(-\frac{t^2}{2}\right) dt \quad (1)$$

where $c_{y_i} = \sum \beta_k X_{ik}$, X_{ik} denotes the k th independent variable ($k=1, \dots, K$), and β_k are the probit coefficients. This model is applied to young men

as a whole to estimate year and enrollment effects on employment and to out-of-school civilian men to assess the effects of additional variables. We report not only the β_k in (1) but also the quantities $\frac{\partial p(d_y=1)}{\partial X_k}$ which measure the effects of the k th independent variable on the probability of employment evaluated at the sample proportion employed. The β_k provide a suitable means of comparing the effects of the independent variables across age groups inasmuch as they are unaffected by varying proportions employed. The $\frac{\partial p(d_y=1)}{\partial X_k}$ directly measure the impact of the independent variables on the employment probability.

In the two-equation model, equation (1) for out-of-school men is combined with a similar equation predicting whether an individual is in the out-of-school civilian population estimated over the total population (e.g., Heckman, 1979; Judge, Hill, and Lee, 1980). This model allows for common unmeasured variables (e.g., ability or attractiveness to employers) to affect the probabilities of employment and enrollment and assesses the degree of correlation between them. The model is tantamount to augmenting (1) with a latent variable that predicts enrollment and enlistment. If this latent variable is correlated with independent variables included in (1), their coefficients will differ between the single- and two-equation models.³

V. EMPIRICAL SPECIFICATION

The analysis consists of two parts, each of which is performed within the age groups 16-19, 20-23, and 24-29: (1) description of trends in racial employment differences for all young men and the effects of enrollment trends on employment trends and (2) analysis of

the causes of employment trends and their race differences for out-of-school civilian men.

Trends in Employment for All Young Men

To describe employment trends we consider several single-equation probit models. We first represent race-specific employment probabilities as:

$$\Phi^{-1}[P(d_{y_i} = 1)] = \beta_0 + \gamma_0 d_i + \sum_{t=65}^{81} \beta_t d_{ti} + \sum_{t=65}^{81} \gamma_t d_i d_{ti}$$

where Φ is the standard normal distribution function, d_i is a dummy variable that equals one if the i th individual ($i=1, \dots, N$) is black and zero otherwise, d_{ti} is a dummy variable that equals one if the i th individual is observed in the t th year ($t=1965, \dots, 1981$) and zero otherwise, and the β 's and γ 's are coefficients. To summarize changes in race-specific employment, we then specify year-to-year changes as resulting from two components, linear trend and business cycle, that is,

$$\Phi^{-1}[P(d_{y_i} = 1)] = \beta_0 + \gamma_0 d_i + \beta_1 Y_i + \beta_2 U_i + \gamma_1 d_i Y_i \quad (2)$$

where Y_i denotes the year in which the i th individual is observed ($Y=1964, \dots, 1981$), and U_i is the average unemployment rate of men aged 25-54 in the year in which the i th individual is observed. The latter measure summarizes the overall level of economic activity in each year. Because the trend-cycle model satisfactorily predicts employment trends, we adopt this parameterization for the balance of the analysis.

To assess the effects of enrollment on employment, we augment (2) with a dummy variable denoting whether an individual is enrolled in school (or enlisted in the armed forces). In addition, we consider whether the depressing effects of enrollment on employment differ by race, with the business cycle, and over time, and whether there are race-specific trend and cyclical effects of enrollment on employment. We investigate these effects by further adding to (2) variables denoting the interactions among race, enrollment status, trend, and business cycle.

As discussed below, race differences in employment differ between students and nonstudents and employment trends also differ between these two groups, but there is little evidence of more complex effects of race, enrollment status, trend, and cycle on employment. Using the resulting simplified model, we adjust employment probabilities for the business cycle and decompose change in employment from 1964 to 1981 into components for (1) changes in enrollment rates; (2) employment trends for students; and (3) employment trends for nonstudents.

Employment Trends of Out-of-School Men

To investigate trends of out-of-school civilian men we examine the effects of measured and unmeasured variables on employment. After examining the race-specific trend in employment of out-of-school civilians using a model of the same form as (2), we consider additional independent variables in models of the form

$$\Phi^{-1} [P(dy_i = 1)] = \beta_0 + \gamma_0 d_i + \beta_1 Y_i + \beta_2 U_i + \gamma_1 d_i Y_i + \sum_{k=1}^K \theta_k X_{ik} \quad (3)$$

where X_{ik} denotes the value on the k th independent variable for the i th individual. In addition to race, trend, and cycle, the independent variables are age, grades of schooling, years out of school, veteran status, and veteran status-age interaction.⁴

Unmeasured Determinants of Employability. We also seek to investigate whether decreases in employment levels of blacks relative to whites are partly the result of disproportionate declines in the black out-of-school civilian population for men with the best employment prospects. To investigate this directly would require measures of ability, motivation, and other attributes that are not observed in CPS or other time-series data. Thus we model the probabilities of school enrollment/enlistment and employment as joint outcomes affected by common unmeasured variables. The employment model includes the variables discussed above. The enrollment/enlistment model includes the effects of year (17 dummy variables), race, race-year interaction, age, race-age interaction, grades of schooling, and age-grades of schooling interaction on the probability of being enrolled in school or enlisting in the armed forces. Using the bivariate probit model, we estimate these equations and the correlation between the z-transformed probabilities (probits) of employment and enrollment/enlistment controlling for the measured independent variables. A positive correlation indicates that similar unmeasured factors affect remaining in school or enlisting and, if one is not in school or the military, being employed. Rising relative enrollment and enlistment for blacks may imply that the race difference on this latent variable in the out-of-school civilian population has grown increasingly unfavorable to blacks and thus contributed to the widening race difference in employment.

VI. FINDINGS

Trends in Employment, Enrollment, and Enlistment

Figure 1 presents age-race-specific trends in proportions of young men employed in March of 1964 through 1981. The individual points (letters) are the observed year-race-age specific employment proportions translated into the probit (z-score) scale. The lines are the estimated employment proportions under models that restrict year-to-year changes to follow the overall business cycle and a linear time trend and race differences to follow a linear trend as well. A comparison of rows A and B of Table 1, which presents the likelihood statistics for these models, suggests that the data reject the trend and cycle restrictions inasmuch as the chi-square statistics implied by the differences of likelihoods are large for the 21 degrees of freedom saved by the simpler model. Throughout our discussion, however, we regard differences in log likelihoods of nested models only as descriptive measures of relative fit, since the number of individual observations is so large and the random sampling assumption is violated for the CPS data. Figure 1 shows that the trend-cycle model closely traces observed employment proportions.

Employment is stable or rising for young white men and falling for their black counterparts. The downward employment trend for young blacks is strongest for men aged 20 and above, whereas the white increases are restricted to men aged 24 and below. As a result, the largest increase in the race difference in employment occurs among 20 to 23 year olds. In the early 1960s, race differences in employment for

Proportion Employed

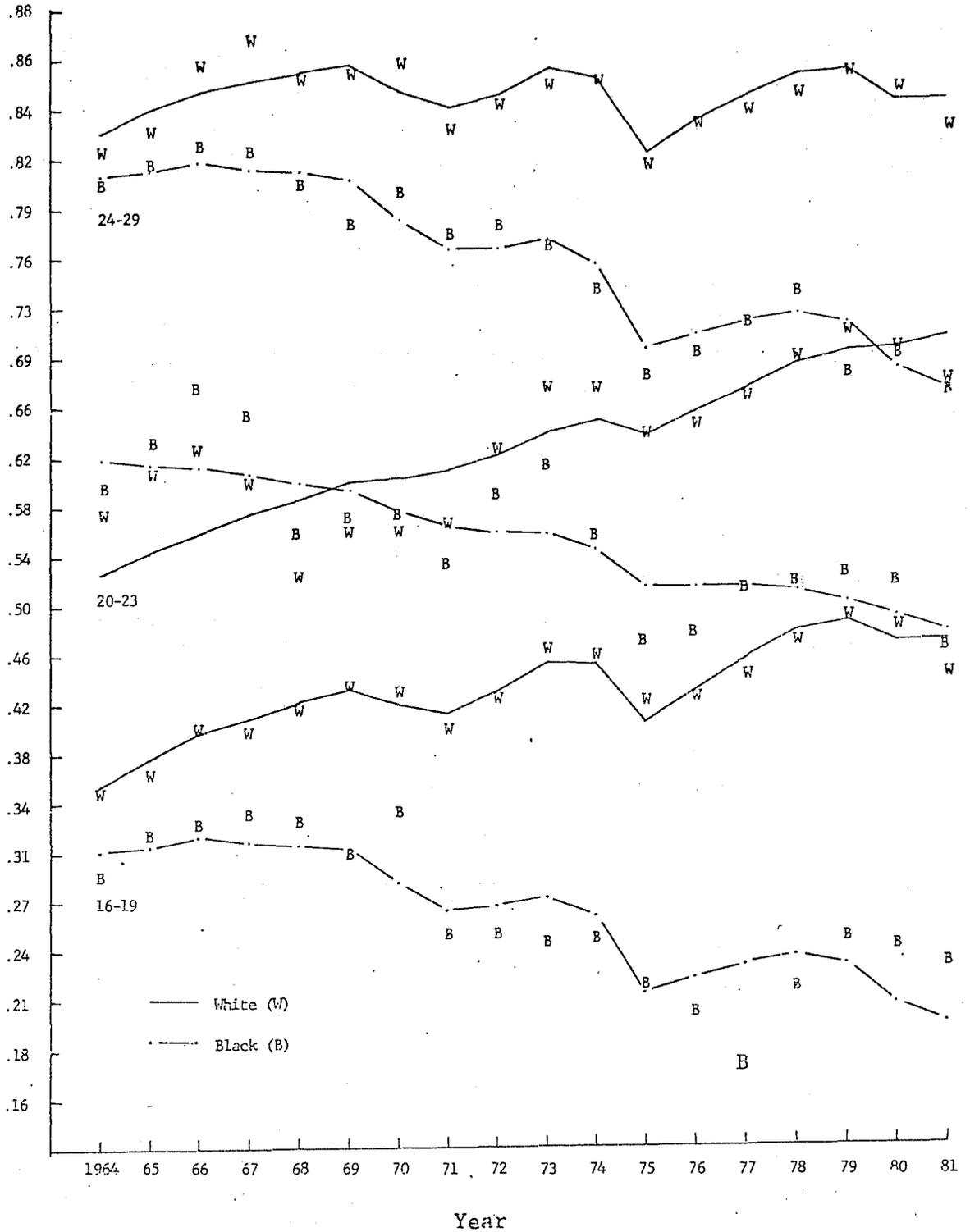


Figure 1. Proportions Employed by Age, Race, and Year: Observed (letters) and Predicted (lines) by Linear Trend and Business Cycle (Model B, Table 1).

young men were small--much smaller than differences for mature workers. By the late 1970s, however, these differences had dramatically widened for all young men.

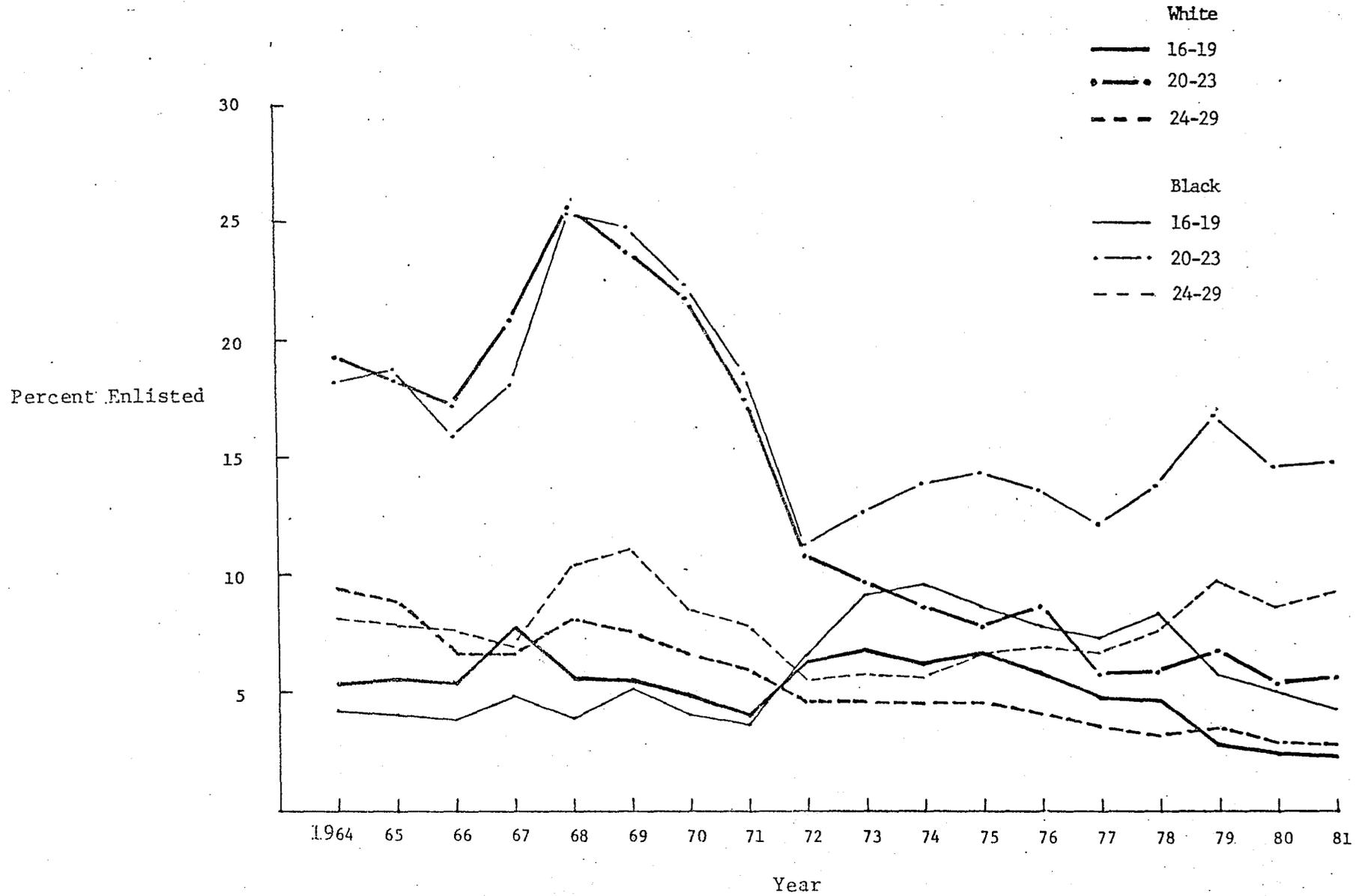
Figures 2a and 2b report race-age specific proportions of young men enlisted in the armed forces and enrolled in school respectively for 1964-81. For each age group, larger proportions of white men than black men were in the armed forces in 1964, whereas the opposite is true in 1981. The trend is particularly striking for those 20 to 23 years old, for whom the race difference in enlistment has ballooned to approximately 10 percentage points. For the younger and older age groups, black enlistment proportions in 1981 are equal to or exceed the peak levels of the Vietnam mobilization, whereas white proportions have declined.

Parallel trends have occurred for school enrollment rates. In each age group, enrollment proportions were lower for blacks than for whites in the 1960s but are now higher, despite the stagnant enrollment growth during this period for all young men. The crossover is again most pronounced for those aged 20 to 23, for whom the white percentage enrolled was approximately 15 percentage points higher than for blacks in 1964 but approximately 5 percentage points lower in 1981.

Enrollment and Enlistment Effects on Employment Trends

The trend in race differences in employment shown in Figure 1 may not uniformly apply to students and nonstudents, nor may black and white young men combine schooling and work at similar rates (Coleman, 1974; Mare and Winship, 1979), nor may employment rates follow the business cycle in similar fashion for blacks and whites. To examine relationships

Figure 2a. Percent in Military by Age, Race, and Year (Total Population).



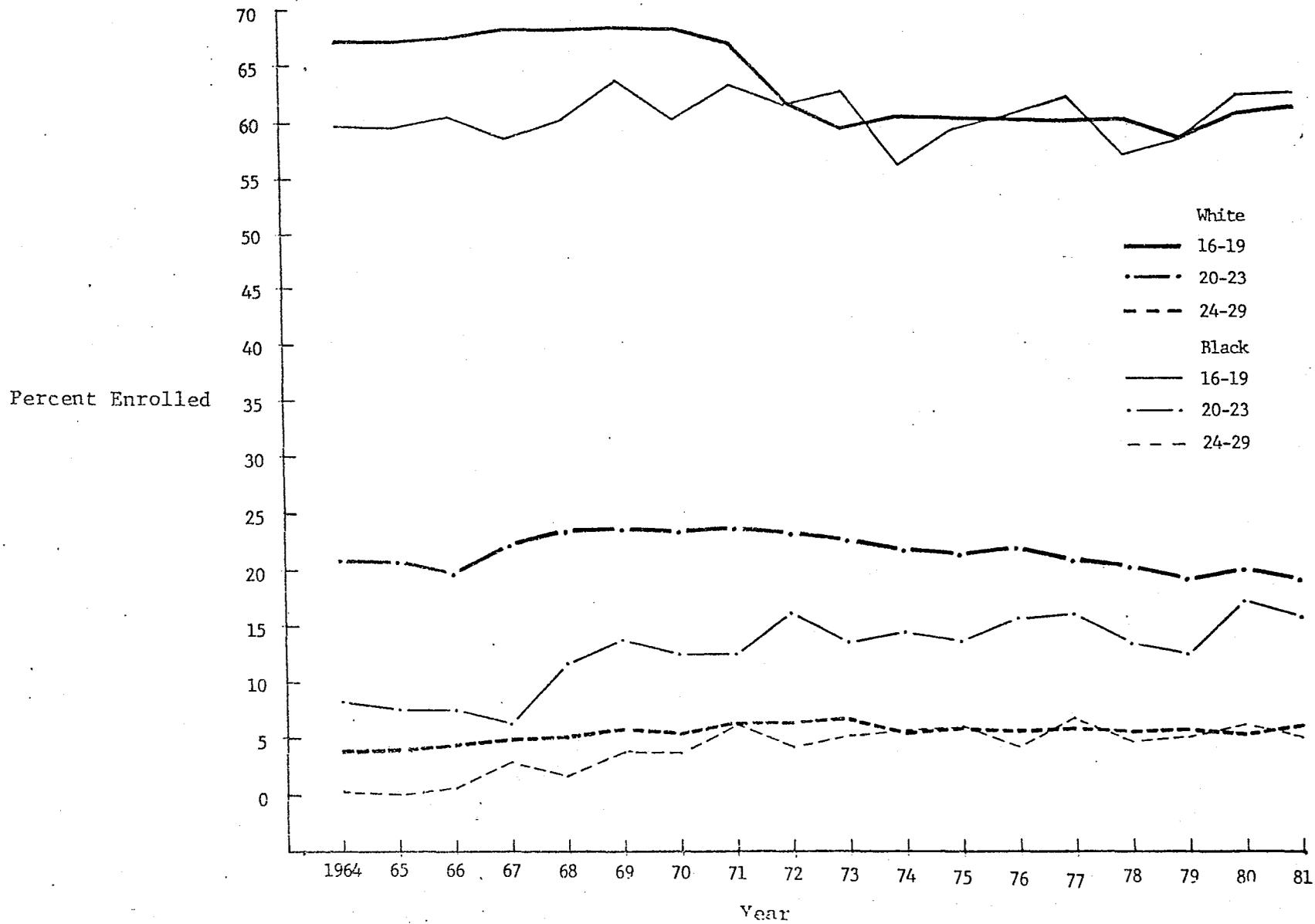


Figure 2b. Percent Enrolled by Age, Race, and Year (Total Population).

among enrollment, enlistment, and employment more systematically, we consider probit models that represent differences in trend and cyclical employment patterns between races and enrollment statuses. Rows A through I of Table 1 present likelihood statistics for these models. Under simple random sampling, differences between these statistics for nested models are distributed chi-square under the null hypothesis of no difference.

Model C (Table 1) augments the trend-cycle model portrayed in Figure 1 with a dummy variable taking the value one if an individual is enrolled or enlisted and zero otherwise. The chi-square statistic for the single degree of freedom used for this effect is large, indicating a much larger employment probability for out-of-school men. Model D includes a separate employment trend for students and nonstudents, again resulting in a substantial change in the likelihood statistic for all age groups. Model E allows for the effects represented in Model D plus a varying enrollment effect for blacks and whites. The chi-square statistics for this effect are 18, 14, and 5 for the three age groups, suggesting race differences in the effect of student status on employment. Model F represents separate employment trends for the four race-enrollment status groups. Relative to Model E, Model F represents a slight improvement in fit for 16-19 year olds, but not for the older groups. Model G allows for the effects in Model F plus a varying effect of enrollment status over the business cycle. This latter effect may result from differential enrollment rates with overall employment levels or differential impact of recessions on job prospects of students and nonstudents. The chi-square statistics for the inclusion of this effect are substantial for all age groups.

Table 1. Likelihood Statistics for Selected Models of Trends in Employment of Young Men by Age and Population

Model	Age						
	16-19		20-24		24-29		
	-2L**	degrees of freedom	-2L	degrees of freedom	-2L	degrees of freedom	
	Total*						
A	Year, Race, Year × Race	127409	1882	104344	2937	93290	2921
B	Trend, Cycle, Race, Trend × Race	127499	1913	104694	2968	93342	2952
C	Model B, Enrollment	119698	1912	77487	2967	68643	2951
D	Model C, Trend × Enrollment	119454	1911	76637	2966	68123	2950
E	Model D, Race × Enrollment	119436	1910	76623	2965	68118	2949
F	Model E, Trend × Race × Enrollment	119432	1909	76622	2964	68118	2948
G	Model F, Cycle × Enrollment	119414	1908	76548	2963	68097	2947
H	Model G, Cycle × Race	119414	1907	76547	2962	68097	2946
I	Model H, Cycle × Race × Enrollment	119414	1906	76546	2961	68096	2945
	Not Enrolled Civilians						
a	Year, Race, Year × Race	39833	1323	48521	2158	56168	1935
b	Trend, Cycle, Race, Trend × Race	39902	1354	48639	2189	56262	1966
c	Model b, Cycle × Race	39902	1353	48639	2188	56261	1965

*Armed Forces are coded as enrolled and not-employed.

** -2L denotes -2 times the natural logarithm of likelihood. Differences in -2L between nested models are distributed χ^2 (under the null hypothesis) with degrees of freedom equalling the difference of degrees of freedom for the two models.

Models H and I allow for varying effects of race and of race within enrollment statuses over the business cycle. These effects might result if the employment probabilities of blacks and whites respond differentially to market booms and busts, as might occur if the two groups were nonrandomly assigned to a "labor queue" (e.g., Thurow, 1975; Hodge, 1973). As Table 1 indicates, however, the chi-square statistics associated with these effects are negligible for all age groups of young men, a finding consistent with other analyses of youth unemployment (Wachter and Kim, 1982).

We use Model G to decompose change in employment between 1964 and 1981 into three parts: (1) changing rates of enrollment and enlistment, (2) changing proportions employed among students, and (3) changing proportions employed among out-of-school civilians.⁵ (Coefficients for this model are available from the authors on request.) Table 2 displays the results.

The relative importance of changes for whites and for blacks differs considerably among the age groups. For the oldest group, where the race difference has widened least, the only change is deterioration in black employment. For 20- to 23-year-olds, where the largest widening has occurred, white employment increases and black decreases contribute equally to the growing spread. For teenagers, increases in white employment are somewhat larger than black decreases.

Changes in rates of enrollment account for substantial proportions of the widening race difference--approximately 20, 45, and 60 percent of the change for the age groups 16 to 19, 20 to 23, 24 to 29 respectively. For men under 24, however, these components are made up more of

Table 2. Components of Change* in Employment, 1964-1981, by Age and Race†

Component#	White		Black		White-Black Difference	
	Change	Percent of Change	Change	Percent of Change	Change	Percent of Change
Age 16-19						
Change in Enrollment Rate	0.0778	23.8	-0.0203	10.5	0.0981	18.9
Change in Employment Rate, Enrolled	0.2387	73.0	-0.0031	1.6	0.2418	46.5
Change in Employment Rate, Not Enrolled	0.0104	3.2	-0.1694	87.9	0.1798	34.6
Total [‡]	0.3269	100.0	-0.1928	100.0	0.5197	100.0
Age 20-23						
Change in Enrollment Rate	0.2308	59.6	-0.0984	27.9	0.3292	44.5
Change in Employment Rate, Enrolled	0.2072	53.5	0.0582	-16.5	0.1490	20.1
Change in Employment Rate, Not Enrolled	-0.0506	-13.1	-0.3127	88.6	0.2621	35.4
Total [‡]	0.3874	100.0	-0.3529	100.0	0.7403	100.0
Age 24-29						
Change in Enrollment Rate	0.0769	-157.6	-0.1328	32.5	0.2097	58.3
Change in Employment Rate, Enrolled	0.0655	-134.2	0.0406	-9.9	0.0249	6.9
Change in Employment Rate, Not Enrolled	-0.1912	391.8	-0.3163	77.4	0.1251	34.8
Total [‡]	-0.0488	100.0	-0.4085	100.0	0.3597	100.0

[‡]Components may not sum to 100.0 percent because of rounding.

*Decomposition examines change between two three-year intervals, 1964-66 and 1979-81, in probit transformed probabilities of employment.

†Total change is estimated from a model that adjusts employment to a common business cycle (aggregate unemployment) level for all years.

#Members of the armed forces are defined as "enrolled" and not employed.

declining white enrollment and enlistment rates than rising black rates, a pattern consistent with the trends in Figure 2. Changes in black employment not accounted for by enrollment trends are almost entirely the result of declining employment among out-of-school men. Changes for whites under 24 mainly result from employment increases among students. For whites 24 and over, employment changes are minimal.

To summarize, from 1964 through 1981 blacks have become more likely than whites to be enrolled in school or enlisted in the armed forces at any age. Because of the strong negative association between enrollment and employment, these trends have contributed to the growing white employment advantage over blacks among young men. A substantial proportion of change in the employment difference, however, remains unexplained by the direct substitution of schooling or military service for work, especially among those 16 to 19 and 20 to 23 years old. Insofar as this change is the result of rising employment among white students, it is beyond the scope of our analysis (see the concluding section). Change that results from employment trends among out-of-school civilian men, however, may result from the additional mechanisms linking enrollment/enlistment and employment trends discussed above.

Determinants of Employment for Out-of-School Civilians

Model 1 of Table 3 includes the effects of measured independent variables on the probability of employment estimated by a single-equation probit model applied to each of the three age groups. The results show that employment rises with age, albeit at a decreasing rate. Veterans are less likely to be employed than nonveterans, but

Table 3. Effects[†] of Independent Variables on Probability of Employment for Out-of-School Young Men, 1964-1981 by Age and Method of Estimation

Independent Variables	Single-Equation			Two-Equation		
	$\partial p / \partial X$	Model 1		$\partial p / \partial X$	Model 2	
		Coefficients ($\hat{\beta}$)	$\frac{\hat{\beta}}{S.E.(\hat{\beta})}$		Coefficients ($\hat{\beta}$)	$\frac{\hat{\beta}}{S.E.(\hat{\beta})}$
Age 16-19						
Age	0.101	0.266	1.7	0.022	0.057	0.3
Veteran (vs. Nonveteran)	-0.192	-0.504	-0.2	-0.249	-0.655	-0.2
Age \times Veteran	0.004	-0.012	0.1	0.007	0.017	0.1
12 Grades (vs. <12 Grades)	0.216	0.569	26.9	0.214	0.562	10.3
>12 Grades (vs. <12 Grades)	0.147	0.385	9.2	0.286	0.752	14.6
Out 2-3 Years (vs. Out 1 Year)	0.084	0.222	12.5	0.094	0.246	9.6
Out 4+ Years (vs. Out 1 Year)	0.095	0.250	9.4	0.105	0.275	7.7
Black (vs. Nonblack)	-0.037	-0.098	-1.8	-0.117	-0.307	-4.7
Trend*	-0.001	-0.002	-0.1	-0.037	-0.095	-3.3
Prime Age Unemployment Rate	-0.045	-0.119	-10.9	-0.050	-0.131	-8.6
Black \times Trend*	-0.131	-0.344	-7.4	-0.084	-0.221	-2.9
ρ^{**}		0.0			0.650	5.9
-2 Log Likelihood		144349 [ⓐ]			144336	
Degrees of Freedom		1905			1904	
Age 20-23						
Age	0.033	0.127	7.4	0.028	0.110	5.8
Veteran (vs. Nonveteran)	-0.283	-1.102	-2.7	-0.326	-1.267	-3.0
Age \times Veteran	0.010	0.037	2.0	0.012	0.044	2.3
12 Grades (vs. <12 Grades)	0.097	0.379	22.5	0.108	0.419	22.5
>12 Grades (vs. <12 Grades)	0.119	0.462	17.5	0.161	0.622	12.5
Out 2-3 Years (vs. Out 1 Year)	0.088	0.341	12.8	0.082	0.321	10.6
Out 4+ Years (vs. Out 1 Year)	0.098	0.383	12.0	0.095	0.369	10.7
Black (vs. Nonblack)	-0.022	-0.087	-1.7	-0.032	-0.125	-2.3
Trend*	-0.028	-0.107	-5.7	-0.029	-0.111	-5.7
Prime age Unemployment Rate	-0.034	-0.133	-14.4	-0.035	-0.136	-14.3
Black \times Trend*	-0.060	-0.235	-5.7	-0.050	-0.196	-4.3
ρ^{**}		0.0			0.258	3.0
-2 Log Likelihood		119848 [ⓐ]			119836	
Degrees of Freedom		2960			2959	
Age 24-29						
Age	0.013	0.076	12.2	0.013	0.082	10.1
Veteran (vs. Nonveteran)	-0.125	-0.765	-3.7	-0.149	-0.918	-3.7
Age \times Veteran	0.004	0.025	3.2	0.004	0.030	3.3
12 Grades (vs. <12 Grades)	0.071	0.436	28.8	0.089	0.543	30.0
>12 Grades (vs. <12 Grades)	0.100	0.613	38.0	0.130	0.801	35.0
Out 2-3 Years (vs. Out 1 Year)	0.009	0.054	0.5	0.010	0.060	0.5
Out 4+ Years (vs. Out 1 Year)	0.008	0.048	0.5	0.004	0.031	0.3
Black (vs. Nonblack)	-0.040	-0.242	-5.2	-0.052	-0.316	5.6
Trend*	-0.037	-0.228	-13.3	-0.043	-0.263	-12.9
Prime Age Unemployment Rate	-0.019	-0.118	-14.1	-0.023	-0.137	-13.6
Black \times Trend*	-0.021	-0.128	-3.4	-0.017	-0.100	-2.0
ρ^{**}		0.0			0.550	
-2 Log Likelihood		109475 [ⓐ]			109453	
Degrees of Freedom		2944			2943	

[†]Effects are evaluated at the sample means of the dependent variable (for 16-19, $p = .6213$; for 20-23, $p = .8258$; for 24-29, $p = .9089$).

*Linear trend multiplied by 10.

**Disturbance correlation for equations predicting employment and enrollment or enlistment (for total population).

[ⓐ]Log Likelihood and degrees of freedom adjusted to be comparable to Model 2 on assumption of an identically specified enrollment equation and zero disturbance correlation.

veteran employment rises more rapidly with age, indicating that the veteran disadvantage gradually disappears (Mare, Winship, and Kubitschek, 1982). Employment probabilities are typically higher for young men with more grades of schooling and, among those 16 to 23 years old, for men who have been out of school a longer period. Black out-of-school civilians are less likely to be employed than their white counterparts, controlling for other independent variables. The coefficients for the race difference are small (denoting approximate differences of two to four percentage points in employment), because they measure race differences at the point where the linear trend is equal to zero, that is, in 1963. The negative coefficients for the interaction between race and trend indicate that the race difference in employment grew by approximately 1.3, 0.6, and 0.2 percentage points per year for the age groups 16 to 19, 20 to 23, and 24 to 29 respectively, once measured factors are controlled.

Model 2 incorporates the effects included in Model 1 as well as the effects of common unmeasured determinants of employment and enrollment or enlistment in the armed forces.⁶ For each age group, there is a substantial positive correlation between the unmeasured causes of employment and enrollment or enlistment. The difference in likelihood statistics between Models 1 and 2 (under random sampling, a chi-square statistic with one degree of freedom) is substantial.⁷ This strongly suggests that students and enlistees would have above-average prospects for employment were they to become out-of-school civilians. It also implies that adverse employment trends may partly result from enrollment and enlistment trends that exclude young men with good employment chances from the nonstudent civilian population.

Several differences between the single- and two-equation results reinforce this interpretation of the correlation between unmeasured causes of employment and enrollment or enlistment. First, the two-equation estimate of the age effect for those 16 to 19 years old is much smaller than the single-equation estimate, indicating that age variation in employment is partly explained by the tendency for young men with the best employment prospects to leave school at a later age than those with poorer chances (Mare, Winship, and Kubitschek, 1982). Second, for all age groups, the two-equation estimates of the race coefficient are notably larger than the single-equation estimates. As noted above, this coefficient measures the race difference in 1963. Differences in employment proportions between blacks and whites in 1963 that are adjusted for measured characteristics alone understate the difference in employment between young blacks and whites who are equivalent on both measured and unmeasured variables. In 1963, when white enrollment and enlistment rates exceeded those of blacks, white out-of-school civilians were relatively less employable than their black counterparts and had only moderately higher employment. Once unmeasured characteristics are controlled, however, a much larger white advantage is revealed.

Third, the coefficient for the linear trend, which denotes the annual change in employment for whites, is larger in the two-equation models, especially for ages 16 to 19. This suggests that reduced enrollment and enlistment rates for whites have raised the proportion of white out-of-school civilians whose employment prospects are relatively good. Employment rates generally decline for whites, but, among men who are equivalent on unmeasured factors, they decline even more. Finally,

the estimated race difference in the employment trend is smaller in the two-equation model, indicating that relative increases in employment and enlistment for blacks have adversely affected the relative employment chances of the remaining out-of-school black civilians. Once unmeasured determinants of employability are taken into account, the widening race difference is partly explained.

Decomposition of Change in Employment for Out-of-School Civilians

Figures 3a-3c summarize the trends in several of the measured independent variables included in the equations reported in Table 3. Figure 3a shows that the proportions of young men who have completed at least high school grew markedly between 1964 and 1981 and that black proportions grew more rapidly than those of whites, especially for the two older groups. Figure 3b shows that young blacks have an increasingly unfavorable distribution of length of time since leaving school. For both blacks and whites, rising ages of school departure have reduced the proportions of the age groups 16 to 19 and 20 to 23 who have been out of school for more than a year. The trend, however, has been much stronger for blacks. Finally, Figure 3c shows that, whereas in the 1960s whites were much more likely than blacks to be veterans, the opposite is now the case.

Table 4 decomposes changes in race-specific (probit-transformed) employment proportions between 1964 and 1981 into parts associated with trends in both measured and unmeasured variables. The decomposition is based on the coefficients of Model 2 in Table 3 and on the means of the independent variables in the model averaged over the intervals 1964-66

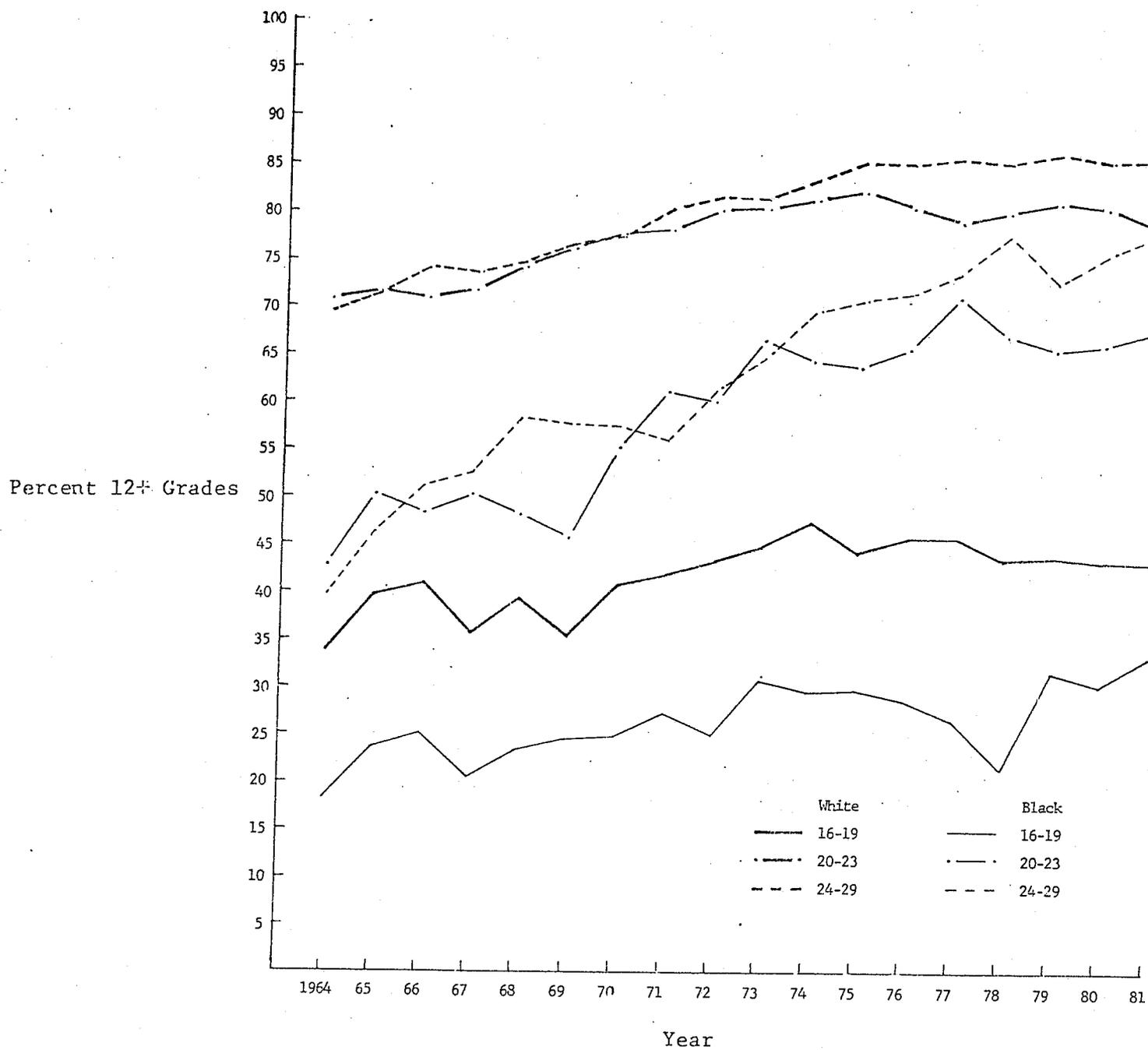


Figure 3a. Percent Completing 12 or More Grades of Schooling by Age, Race, and Year (Out-of-School Population).

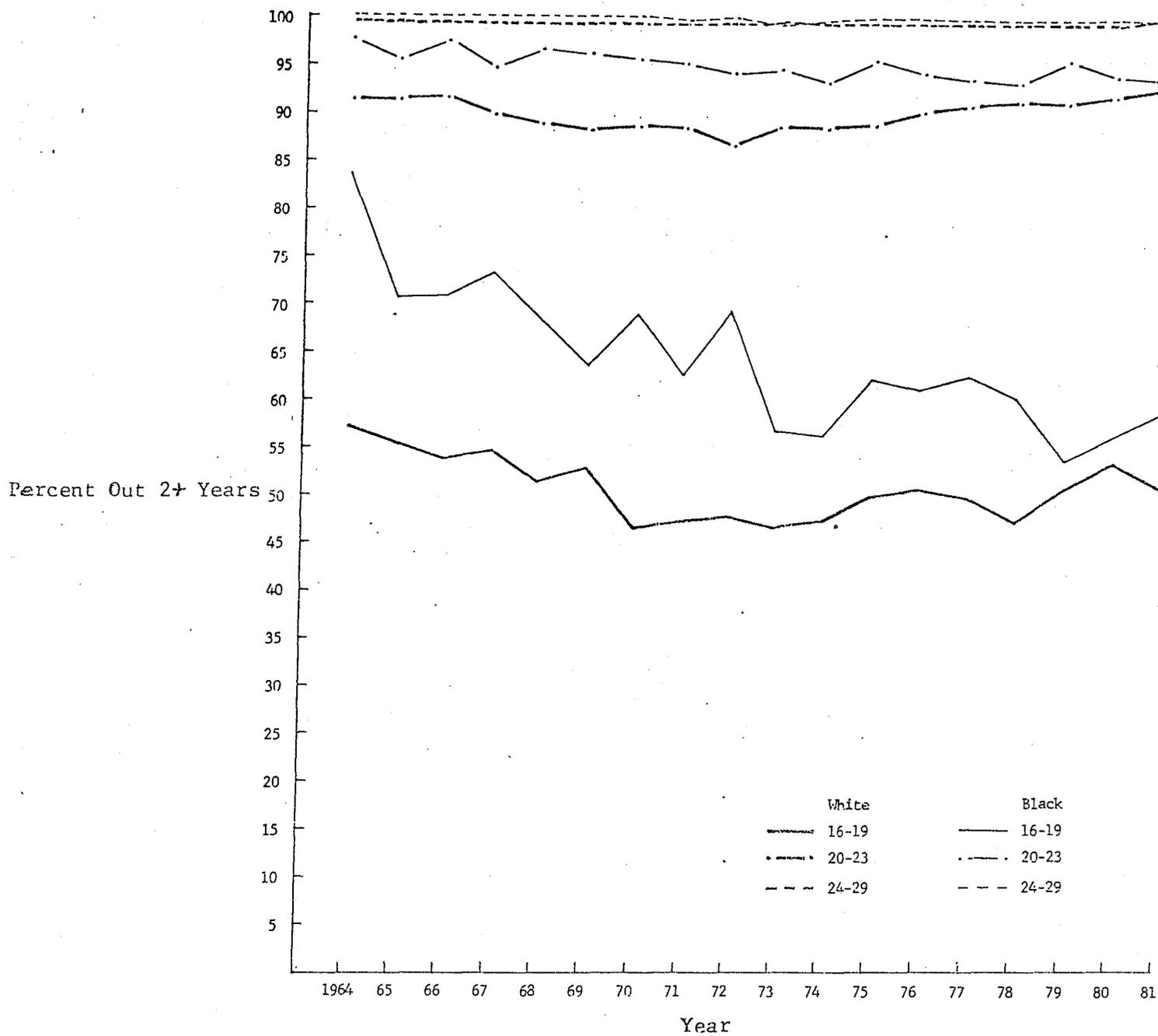


Figure 3b. Percent Out of School 2 or More Years by Age, Race, and Year (Out-of-School Population).

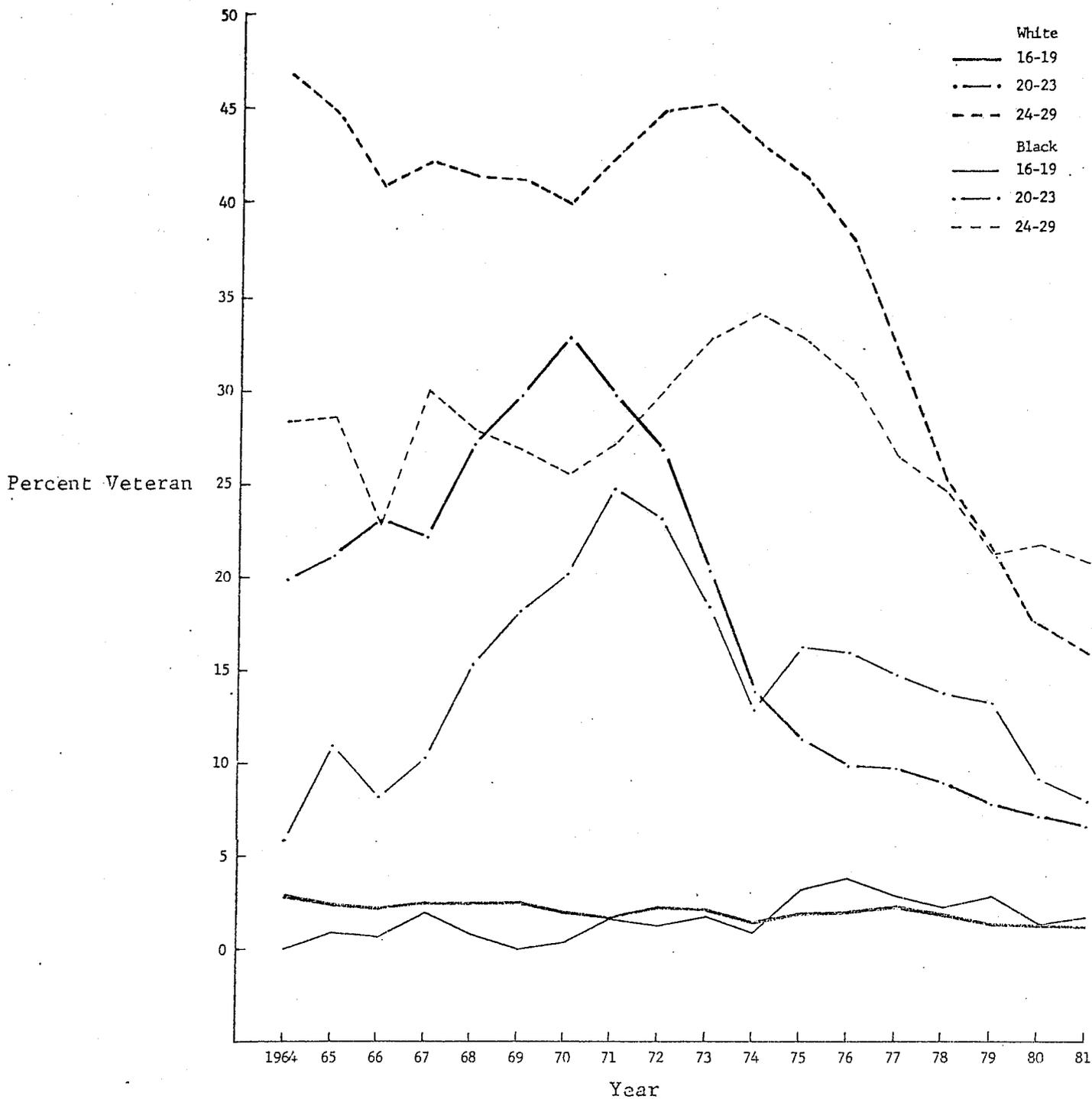


Figure 3c. Percent Veteran by Age, Race, and Year (Out-of-School Population).

Table 4. Components of Change* in Employment (Probit), 1964-1981, Out-of-School Noninstitutional Men, by Age

Component	White		Black		Difference	
	Change	Percent of Noncyclical Change	Change	Percent of Noncyclical Change	Change	Percent of Change
Age 16-19						
Grades of Schooling	0.023	57.5	0.041	-10.2	-0.018	-4.1
Years Out of School	-0.009	-22.5	-0.039	9.7	0.030	6.8
Age	0.002	5.0	0.000	-0.0	0.002	0.5
Veteran Status	0.003	7.5	-0.003	0.7	0.006	1.4
Age-Veteran Status Interaction	0.000	0.0	-0.000	0.0	0.000	0.0
Business Cycle	-0.110	---	-0.110	---	---	---
Enrollment and Enlistment Selection	0.129	322.5	-0.040	10.0	0.169	38.3
Residual	-0.108	-270.0	-0.360	89.8	0.252	57.1
Total [@]	-0.070	100.0	-0.511	100.0	0.441	100.0
Age 20-23						
Grades of Schooling	0.047	-123.7	0.092	-22.9	-0.045	-12.4
Years Out of School	-0.002	5.3	-0.014	3.5	0.012	3.3
Age	-0.003	9.8	-0.002	0.5	-0.001	-0.3
Veteran Status	0.034	-89.5	-0.004	1.0	0.038	10.5
Age-Veteran Status Interaction	-0.000	0.0	-0.000	-0.0	0.000	0.0
Business Cycle	-0.145	---	-0.145	---	---	---
Enrollment and Enlistment Selection	0.047	-123.7	-0.029	7.2	0.076	20.9
Residual	-0.161	423.7	-0.444	110.7	0.283	78.0
Total [@]	-0.183	100.0	-0.546	100.0	0.363	100.0
Age 24-29						
Grades of Schooling	0.110	-64.3	0.175	-52.6	-0.065	-40.1
Years Out of School	0.000	0.0	0.000	0.0	0.000	0.0
Age	0.007	-4.1	-0.001	0.3	0.008	4.9
Veteran Status	0.021	-12.3	0.003	-0.9	0.018	11.1
Age-Veteran Status Interaction	-0.005	2.9	0.002	-0.6	-0.007	-4.3
Business Cycle	-0.126	---	-0.126	---	---	---
Enrollment and Enlistment Selection	0.025	-14.6	-0.059	17.7	0.084	51.9
Residual	-0.329	192.4	-0.453	136.0	0.124	76.5
Total [@]	-0.297	100.0	-0.459	100.0	0.162	100.0

*Decomposition is based on probit coefficients for Model 2 in Table 4 and three-year average data for 1964-66 and 1979-81.

[@]Components may not sum to reported totals because of rounding.

and 1979-81.⁸ For whites, the decomposition shows that the drop in employment is almost entirely due to the business cycle for the age groups 16 to 19 and 20 to 23, whereas a substantial part of change is noncyclical and unexplained for those 24 to 29 years old. For blacks, in contrast, most of the decline in employment is not the result of cyclical change. The increasingly unfavorable distribution for blacks on unmeasured determinants of employment accounts for approximately 10, 7, and 17 percent of the noncyclical black employment decline for the 16 to 19, 20 to 23, and 24 to 29 age groups respectively. Nonnegligible proportions of the decline for the two younger age groups are also due to the reduced average time young blacks have been out-of-school. The residual component of change is very large, but this results in part from the substantial offsetting change in grades of schooling which has been a force raising black employment.

Although the race-specific decompositions provide meager support for the mechanisms of change discussed in this paper, the decomposition of change in the race difference shows that the combined influences of change related to enrollment and enlistment on blacks and whites account for substantial portions of the broadening race employment difference. As the final two columns of Table 5 show, the changing race difference on unmeasured determinants of employment accounts for roughly 40, 20, and 50 percent of change in the race difference in employment, a result of the declining enrollment and enlistment rates of whites combined with stable or rising rates for blacks. Approximately 7 and 3 percent of the changing difference in employment for those 16 to 19 and 20 to 23 years old respectively is accounted for by changing race differences in

Table 5. Percentage Decomposition of Change in Race Differences in Employment, 1964-1981, By Age: Summary

Component	Age			
	16-19	20-23	24-29	16-29
Change in Enrollment Rate	18.9	44.5	58.3	39.3
Change in Employment Rate for Not Enrolled				
Change in Transition from School and Military to Work	16.3	12.2	22.1	15.8
Change in Educational Attainment for Out-of-School Civilians	-1.4	-4.4	-14.0	-4.7
Unexplained Change for Out-of-School Civilians	19.8	27.6	26.6	23.9
Change in Employment Rate for Enrolled	46.5	20.1	6.9	25.7
Total ^a	100.0	100.0	100.0	100.0

^aComponents may not sum to reported totals because of rounding.

average time since leaving school. For young men in their twenties, approximately 10 percent of the change in race difference is attributable to the growing representation of blacks in the veteran population.

Taken together, the increasing relative numbers of blacks in the vulnerable newly out-of-school or out-of-the-military populations and the changing racial distribution on unmeasured determinants of employment account for approximately 46, 35 and 59 percent of the widening white-black employment difference among out-of-school civilian men for the three age groups. Of course, the residual change in the race difference remains large, again partly the result of offsetting improvements in the relative educational status of blacks that would otherwise have reduced the race employment difference. A more conservative estimate of our success in explaining the changing race difference, 100 minus the residual percentage, indicates the amount of the change that these mechanisms would have explained if there had been no relative change in educational attainment. By this measure, we account for approximately 43, 22, and 24 percent of change in the race difference for the three age groups.

Accounting for Changing Race Differences in Employment: Summary

The decompositions of Tables 2 and 4 can be combined to yield overall estimates of the contribution of increased substitution of schooling and military service for work by young blacks to the widening race differences in youth employment, to the increasing relative numbers of black veterans and recent school-leavers, who are especially vulnerable to joblessness, and to the changing race-specific composition of the out-of-

school civilian population on unmeasured factors affecting success in school, the military, and the labor market. Table 5 summarizes the decompositions. The first two rows of the table indicate the contribution of changing enrollment rates and changing patterns of movement out of school and the armed forces to changing race differences in employment. The third row indicates the percentage of the change that is offset by relative levels of schooling completed by blacks. The fourth and fifth rows denote the unexplained portions of change for out-of-school civilians and for students respectively. If we ignore the dampening effect of changes in relative levels of educational attainment on the race difference, their results imply that the three mechanisms account for approximately 35 percent of change in the race difference for the age group 16 to 19, 57 percent for the age group 20 to 23, 80 percent for the age group 24 to 29, and 56 percent for the three age groups combined. If we take account of the changes in educational attainment and focus instead on the complement of the residual changes in Table 6, then the three mechanisms still account for approximately 34 percent of change for the age group 16 to 19, 52 percent for the age group 20 to 23, 67 percent of change for the age group 24 to 29, and 50 percent for all three groups. In sum, a substantial portion of the increasing race difference in youth employment can be accounted for by processes related to rising black participation in school and the armed forces.

VII. CONCLUSION

Despite our success in accounting for changing employment differences between young blacks and whites, it is important to recognize the

limitations of our models and their explanatory power. Our assessment of enrollment effects on employment for the total population and of selection effects on the employment of out-of-school civilians assumes that enrollment and enlistment trends are driven by exogenous variables, such as family background trends, war or peace, the draft, the age structure of the population, and macroeconomic conditions. That young men make enrollment and enlistment decisions while cognizant of their job prospects, or, more generally, that schooling, work, and military decisions and opportunities are determined jointly, are not fully taken into account. Although our two-equation estimates suggest that the most employable men substitute schooling or military service for work, they may nonetheless reflect the effects of a complex mixture of incentives, opportunities, and costs that structure young men's decisions about work, schooling, the military, and other activities.

With regard to the explanatory limitations of our analyses, a large part of the change in the race employment difference from 1964 to 1981 is unexplained by the mechanisms considered here. A major source of change is growing employment among white teenage students. This change may result from fewer obligations to school and family, from changed economic requirements of middle class student lifestyles, or from real or perceived changes in the long-run economic benefit to work experience while in school (relative to attending school without working) (Meyer and Wise, 1982). For out-of-school young men, some of the explanations for youth labor force trends enumerated in the Introduction may account for part of the unexplained decline in the relative employment position of young blacks. Inadequate demand for young workers induced by the

changing skill composition of the economy, spreading minimum wage legislation, large youth cohort sizes, and unsalutary aggregate economic conditions may disproportionately hurt young blacks if employers prefer to hire white youths over blacks (e.g., Hodge, 1973; Thurow, 1975).

Finally, our analyses do not apply to the substantial widening of the black-white employment difference occurring between 1940 and 1960, which appears to result not only from enrollment trends, but also from the decline in low-skill, especially agricultural, jobs (Fisher, 1973; Mare and Winship, 1979; Cogan, 1982).

Despite their limitations, however, our analyses provide much support for our arguments. The growing race difference in employment is, in part, a consequence of otherwise salutary changes in the lives of young blacks, especially increased school enrollment and educational attainment. In this sense, broadening race differences in youth employment are consistent with diminished differences on other indicators of socioeconomic achievement. This argument does not imply that widening race differences in employment are an acceptable development or a "necessary" byproduct of otherwise favorable socioeconomic change. Rather, the apparent absence of broad race differences in youth employment prior to the mid-1960s was an illusion created by enormous race differences in other aspects of socioeconomic standing and activity patterns that concealed race differences in employment. Before the recent relative rise in black schooling and military service, young blacks had a "head start" in the labor market because their white counterparts elected to seek full-time employment at much later ages. Now

that blacks and whites are more equal in their timing of movement out of school and the military, the true race difference in employment is revealed.

We cannot resolve whether recent changes in racial stratification are permanent or transitory. Our results suggest, however, that worsening labor force statistics for black youths do not denote increasing racial inequality, but rather persistent racial inequalities previously hidden by race differences in other aspects of young adulthood. In addition, the array of socioeconomic differences between the races that remain to be overcome is larger than would be revealed by socioeconomic and labor force data for the early 1960s. Although the race difference in employment is not a "new" inequality, it persists while other differences have gradually eroded. Political efforts to reduce discrimination in the workplace and to increase black schooling have apparently not extended to race differences in school quality, family environment, and the availability of jobs commensurate with the skills that young persons possess, all of which may contribute to persisting race differences in joblessness. If joblessness in youth hurts later socioeconomic achievement (Feldstein and Ellwood, 1982), then persistently high youth unemployment for blacks will prevent full equality in the adult labor market. Moreover, if good opportunities are now available to blacks with high levels of education (Freeman, 1976; Wilson, 1978), then inequalities within the black population are likely to grow.

FOOTNOTES

¹"Major Activity" is coded on the CPS files for 1968-81, but not for 1964-67. For all 18 years, however, it is possible to identify persons who were not working because they were in school or who were working part-time because they were attending school. Classifying persons as enrolled who meet either of these criteria closely approximates defining enrollment on the basis of the Major Activity.

²Years out of school is approximated as age minus highest grade of school attended minus five. Thus, age, grades of schooling, and years out of school are linearly dependent and their separate effects on employment are generally not identified. In the analyses presented here, identification is achieved through aggregation of categories of schooling and years out of school, as described in the text. The estimated effects of these variables agree closely with cross-sectional analyses of data that do not suffer from linear dependence of the three variables because they contain an independent measure of time out of school (Mare, Winship, and Kubitschek, 1982).

³It would be preferable to regard enrollment, enlistment, employment, and joblessness as four separate alternatives. Although probit models for four alternatives are available (e.g., Hausman and Wise, 1978), reliable statistical software is only available for three-choice models such as the one considered here.

⁴We considered other factors, such as two-way interactions between race, age, grades of schooling, years out-of-school, and time. Interactions combining race or time with other variables were nearly always statistically insignificant. Some other interactions were signi-

ficant but did not affect the interpretation of the lower-order effects considered here. We also examined other classifications of the independent variables, but these did not affect our conclusions.

⁵Components are adjusted to the average business cycle level for 1964-81 and are presented in the probit scale. The race-specific components are calculated according to the formula

$$z_{81} - z_{64} = \left\{ (p_{81} - p_{64}) \left(\frac{z_{81}^e + z_{64}^e}{2} \right) + [(1 - p_{81}) - (1 - p_{64})] \left(\frac{z_{81}^n + z_{64}^n}{2} \right) \right\} \\ + \left[(z_{81}^e - z_{64}^e) \left(\frac{p_{81} + p_{64}}{2} \right) \right] + \left[(z_{81}^n - z_{64}^n) \left(\frac{(1 - p_{81}) + (1 - p_{64})}{2} \right) \right]$$

(Kitagawa, 1955), where p_{64} and p_{81} are the year-specific proportions either enrolled in school or enlisted in the armed forces, z_{64} and z_{81} are the year-specific probits of the proportions employed adjusted to the average prime-age male unemployment rate for 1964-1981, and the superscripts e and n denote the enrolled/enlisted and not enrolled/not-enlisted populations respectively. The components for race differences are the differences of their respective race-specific components.

⁶To save space, the selection equations for these models are not reported here. Estimates are available from the authors on request.

⁷An anomaly occurs in the estimated normal statistic for rho for the 24 to 29 age group. The statistic should be approximately the square root of the likelihood ratio chi-square for the improvement in fit between Models 1 and 2, that is, $\sqrt{22} = 4.7$. The statistic, however, is

only 1.5. This suggests an ill-behaved likelihood surface for this age group, a possible consequence of the small numbers of students or members of the armed forces. Exploration of the likelihood surface failed to yield alternative estimates. Our specific estimates should be interpreted cautiously.

⁸The components in Table 5 for measured variables are the differences between the means for 1979-81 and 1964-66 weighted by their respective parameters in Model 2 of Table 4. The component for "Enrollment and Enlistment Selection" is

$$\frac{\rho}{\sqrt{1-\rho^2}} \frac{\phi(c)}{1-\Phi(c)}_{81} - \frac{\phi(c)}{1-\Phi(c)}_{64}$$

where ρ is the correlation between unmeasured determinants of employment and enrollment or enlistment, c denotes predicted values in the selection equation, ϕ and Φ are the standard normal density and distribution functions respectively, and the subscripts 64 and 81 denote that the ratios are evaluated at their means for 1964-66 and 1979-81.

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