Cohort Change and Racial Differences in Educational and Income Mobility

Deirdre Bloome, *Harvard University*
Bruce Western, *Harvard University*

Policy reforms and rising income inequality transformed educational and economic opportunities for Americans approaching midlife in the 1990s. Rising income inequality may have reduced mobility, as income gaps increased between rich and poor children. Against the effects of rising inequality, Civil Rights reforms may have increased mobility, as opportunities expanded across cohorts of black students and workers. We compare educational and income mobility for two cohorts of black and white men, the older born in the late 1940s and the younger born in the early 1960s. We find that educational mobility increased for black men, but income mobility declined for both races. Economic mobility declined despite unchanged or improved educational mobility because of increased returns to schooling and increased intergenerational income correlations, independent of schooling.

The link between stratification and mobility is fundamental to the sociological perspective on inequality. In this perspective, the prevailing pattern of socioeconomic inequality constrains children's opportunities and shapes how parents pass on advantages. Large-scale changes in inequality – perhaps through industrialization or institutional reform – are expected to produce changes in intergenerational mobility. Thus, rising mobility with industrial modernization and convergence of mobility patterns across industrialized countries have been core hypotheses of the research program (for reviews see Breen and Jonsson 2005; van Leeuwen and Maas 2010).

Two large and cross-cutting changes in social inequality through the latter decades of the 20th century in the United States motivate an examination of recent mobility trends. First, income inequality – and income inequality by education – increased since the mid-1970s. As material resources became more dispersed across the children of the rich and poor, income mobility may have declined. Second, policy reforms improved educational and economic opportunities for African Americans. Although we might expect Civil Rights reforms to increase black mobility, it remains an open empirical question whether mobility increased in a context of growing inequality across the nation as a whole.

The growth in U.S. income inequality offers several challenges to the study of mobility. Mobility research in sociology has focused on occupations, not incomes. However, when income inequality is rising, occupation becomes an unstable indicator of socioeconomic status since inequality rises both within and between occupations.

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To understand the reproduction of inequality in the final decades of the 20th century, mobility analysis should extend to incomes. In the context of rising inequality and Civil Rights reforms, educational attainment is also central to explaining income mobility. As educational inequality in incomes increases, educational attainment becomes a more important channel for income mobility. Further, education trends likely evolved differently for black and white men because the institutional context of schooling changed so greatly for black men.

We study recent trends in men's mobility, examining two kinds of variation. First, we estimate trends in educational and income mobility, supplementing recent research on occupations (Beller and Hout 2006; Beller 2009). Second, we contrast mobility trends for black and white men. These analyses compare large samples of two cohorts from the National Longitudinal Surveys. The older cohort, born 1945 to 1952 and drawn from the National Longitudinal Survey of Young Men (NLS66), reached their early 30s in the late 1970s and early 1980s as income inequality began to increase. The younger cohort, born 1958 to 1965 and drawn from the National Longitudinal Survey of Youth (NLSY79), grew up through a period of rising inequality in which the main pillars of Civil Rights reform were nevertheless institutionalized.

Income and Educational Mobility

Economists and sociologists share an interest in how mobility relates to changes in the distribution of economic resources (Morgan 2006). Despite a common foundation, researchers in the two disciplines have examined different outcomes. In sociology, mobility describes "the process of stratification," by which the distribution of life chances and socioeconomic status passes from one generation to the next (Hauser and Featherman 1977). Socioeconomic status is typically measured by occupation – an enduring place in the economic system correlated with income, education and social status. Additionally, education is often measured directly, on the assumption that schooling describes individuals' potential attainments and life chances. Together, education and occupation form the key markers of status attainment and the dimensions along which mobility is typically measured in sociological studies.

Instead of studying education or occupation, economists focus on the incomes of parents and their adult children. Two connections between inequality and mobility have prompted studies of the intergenerational inheritance of incomes. For one line of research, cross-sectional snapshots of the income distribution might overstate inequality if mobility over the life course or across generations evens out the economic status of individuals and families. On the other hand, declining mobility associated with rising income inequality might indicate an enduring polarization of economic life. Economists have studied these contending ideas by examining whether income mobility is greater in countries with lower income inequality and whether mobility declined as inequality increased (for a review see Björkland and Jäntti 2009).

Rising U.S. income inequality motivates recent research on income mobility trends. Several studies examined successive cohorts of children born since the early 1950s.

These studies summarized mobility with an "intergenerational income elasticity" obtained from a regression of children's log incomes (at around age 30) on the log incomes of their parents when the children were teenagers (Fertig 2003; Hertz 2007; Lee and Solon 2009; Mayer and Lopoo 2005). With this model, rising inequality may induce a decline in mobility. Even if the correlation between parents' and sons' incomes remains constant, the income elasticity may increase because sons' incomes become more unequal across the incomes of their parents.

Empirical studies unevenly support the hypothesis of declining income mobility. Sample sizes of birth cohorts in the Panel Study of Income Dynamics were often too small to discern a statistically significant trend (Fertig 2003; Mayer and Lopoo 2005). Because the data were sparse, results were also sensitive to model specification and the coding of incomes at origin and destination (Hertz 2007; Lee and Solon 2009). Analyses of larger samples from the National Longitudinal Surveys and the U.S. Census provided stronger evidence of declining mobility in the period of rising inequality. Levine and Mazumder (2002), similar to our approach, found income elasticities roughly doubled from the 1966 to the 1979 cohorts of the NLS. Their analysis, however, focuses on respondents in two-parent households and did not explore race-specific trends. Aaronson and Mazumder (2008) analyzed census data from 1940 to 2000, and reported that income mobility declined during the 1980s and remained at a low level in the 1990s. The census offered large samples and a long historical perspective, but it provided no direct measures of parental income, which was proxied by the average state income in the year of son's birth.

Despite mixed evidence about income mobility trends, the era of inequality challenges the sociological analysis of intergenerational mobility. The occupational data of sociology may be less informative when income inequality is rising. As U.S. income inequality increased, average earnings also became more unequal across occupations (Mouw and Kalleberg 2010). Under these conditions, sons working in the same occupations as their fathers may lose economic status, in the case of blue collar workers, or gain it, in the case of some professionals and upper managers. As the relationship between occupation and incomes shifted, studies of income mobility offer an important supplement to the sociological focus on occupational mobility.

However, the analysis of income mobility, by itself, is also incomplete. U.S. income inequality was driven in part by the rising pay of college graduates. The college wage premium increased by about half from the early 1980s to the early 2000s (Autor, Katz and Kearney 2008; Goldin and Katz 2008). As incomes became more stratified by education, educational inheritance may have become a more important channel for income inheritance. Educational mobility, too, may have declined with rising income inequality. College tuition increased in the era of inequality, and increases in college attendance were concentrated among high income families (Ellwood and Kane 2000; Kane 2004). This pattern is consistent with Raftery and Hout's (1993) hypothesis of maximally maintained inequality in which the most affluent families are the first to fill new places in higher education.

In sum, the era of U.S. income inequality motivates a synthesis of sociological and economic mobility research. This synthesis has three key elements. First, income mobility may have declined as a byproduct of the widening income distribution. In this case, children of high-income parents may not have become more likely to remain at the top, but incomes at the top increased in relative terms. Second, educational mobility may have played an increasingly important role in income mobility in so far as educational inheritance and the returns to education increased in the era of inequality. Income and educational mobility should thus be studied together. Third, income mobility may have declined for other reasons, independent of trends in the income distribution and trends in education. If neither education nor income inequality are the main drivers, we show that any decline in income mobility must be driven by the increasing intergenerational correlation in incomes, conditional on years of education. With large samples from two cohorts, we are able to decompose these three components of the trend in income mobility.

Race and Mobility

The mobility process unfolds over generations and the era of inequality is short-lived compared to the slow improvement in the educational and economic status of black Americans through the 20th century. For postwar cohorts, Civil Rights reforms may have mitigated the effects of rising inequality by increasing incomes and educational attainment.

Institutional reforms improved educational opportunities for black Americans since at least the 1950s, although progress was not without setbacks. Following the Supreme Court's decision in Brown v. Board of Education (1954), federal courts promoted desegregation in local school districts. Despite judicial supervision, racial imbalance in schools persisted. The associated disparities in school resources have been widely litigated since the 1970s in suits for school finance equalization (GAO 1998). At the postsecondary level, the 1965 Higher Education Act initiated grant and loan programs, and support for low-income students expanded through the 1970s. The generosity of financial aid was reduced through the 1980s as loans, not grants, became the main vehicle for federal subsidy. Affirmative action programs, more common at elite colleges, were also recognized by the courts through the 1970s. Similar to the development of financial aid, political opposition gathered through the 1980s and affirmative action in college admissions narrowed through the 1990s (Garrow 2010).

Labor market reform followed a similar path to education policy. Anti-discrimination and equal opportunity efforts gathered momentum in the 1960s and the 1970s, then slowed in the face of political opposition by the late 1980s. The Civil Rights Act of 1964 outlawed racial discrimination in employment and established the Equal Employment Opportunity Commission. Armed with litigation authority in 1972, the EEOC expanded anti-discrimination enforcement through the 1970s, but these efforts slowed in the following decade (Wakefield and Uggen 2004; Wood 1990). Federal contractors have operated with an affirmative action obligation in hiring since

the 1960s. Private anti-discrimination measures including policies enacted by human resource departments in large firms also expanded significantly from the early 1970s (Dobbin et al. 1993).

The policy environment of school and work changed greatly from the mid-1960s, when the first NLS cohort reached college age, to the early 1980s, when the second cohort entered college. Black parents of the older cohort grew up decades before the Civil Rights movement. Their children were among the first beneficiaries of school desegregation and college assistance. The younger cohort encountered an educational system and economy already shaped by institutionalized reforms reducing racial barriers to education and employment. Unlike the older cohort, the parents of the younger cohort also benefited from the improved educational and economic opportunities of the 1960s.

How did social mobility change in the context of institutional reform? The liberalization of educational institutions was associated with a significant rise in black Americans' educational attainment (for reviews see Baker and Vélez 1996; Kao and Thompson 2003). Indeed, despite a persistent racial gap in schooling, educational attainment for black Americans increased for the first eight decades of the 20th century and at a faster rate than for white Americans (Hauser 1993). In 1965, only 27.2 percent of black adults had completed a high school education compared to 51.2 percent by 1980 (U.S. Census Bureau 2010). The rise in educational attainment was driven by new cohorts exceeding their parents by completing high school. Educational mobility likely increased as parents' education became less predictive of their children's.

Institutional reforms may also be associated with trends in economic mobility. Motivated by changing American race relations, sociologists studied mobility trends for black Americans, focusing on occupations instead of incomes (Blau and Duncan 1967; Featherman and Hauser 1976; Hout 1984b). Increased educational attainment expanded access to white collar work, particularly in the public sector and large firms. Anti-discrimination enforcement and affirmative action for federal contractors assisted entry into skilled trades. Similar to trends in educational attainment, occupational attainment thus increased significantly for black Americans throughout the postwar period.

Improved economic standing, however, is not necessarily associated with increased mobility. Comparisons of black mobility in the early 1960s to the early 1970s with the Occupational Change in a Generation Surveys showed a decline in mobility as occupational status increased. In the early 1960s, black Americans' economic status was largely detached from that of their parents. Small upward and downward movements within the narrow range of jobs available to black workers produced high rates of measured mobility. Indications of social openness reflected parents' inability to pass along small advantages to their children and children's inability to move far beyond their parents' station (Hout 1984a). By the early 1970s, the association between black fathers' and sons' occupational status had increased as the sons of high-status fathers rose towards the top of the occupational hierarchy (Featherman and Hauser 1976, Hout 1984a). However, recent studies from the era of inequality report high rates of

downward mobility for black children, perhaps illustrating the limits of institutional reform. Not only is downward mobility more likely for black children than white children, but upward mobility is less likely. Black children in the bottom quintile of the income distribution experience little upward mobility compared to low-income white children (Bhattacharya and Mazumder 2007; Hertz 2005; Isaacs 2008).

In sum, mobility may have declined in the era of inequality, but analysis should distinguish mobility trends by race. Civil Rights reforms are associated with rising educational attainment and economic status among black Americans, providing collective mobility for the parents and children in the younger NLS cohort. Previous research on black mobility found that educational attainment became more detached from family background, while economic status became more strongly associated with family background. To analyze mobility trends for black and white Americans under the confluence of rising inequality and Civil Rights, we distinguish income and educational attainment, and study the role of education in explaining income mobility.

Data and Measures

We analyze data from two cohorts of the National Longitudinal Surveys: the 1966 Young Men (NLS66) cohort and the 1979 Youth (NLSY79) cohort. The NLS66 surveyed a national sample of 5,225 men ages 14 to 24 in 1966 and re-interviewed them regularly through 1981. The NLSY79 covers a national sample of 12,868 men and women ages 14 to 22 in 1979. The NLSY79 cohort was surveyed annually through 1994 and biannually thereafter. Useful for our analysis of racial differences, both surveys oversample black Americans. The older cohort entered the labor market shortly after major Civil Rights advances and just prior to the large increases in economic inequality. The younger cohort entered the labor market during a period of rising income inequality but after Civil Rights reforms were widely institutionalized.

Within each cohort, we analyze the incomes and educational attainment of sons and their parents. We study sons because the NLS66 includes only men. A slightly different cohort of women could be studied with the 1968 NLS Young Women's survey. Still, cohort changes in women's mobility are likely to be influenced by different forces than those of key interest here. Changes in women's labor force participation, for example, would be confounded with rising income inequality and Civil Rights reforms.

With two cohorts of panel data, we code two observations for each son. First, we obtain parents' income and education for sons ages 14 to 21 who are living at home with at least one parent. This age group ensures consistency across cohorts and excludes late home-leavers. The second, follow-up, observation is taken 12 to 15 years later, the longest lag possible given the end point of the NLS66 survey. At follow-up we record the family income and educational attainment of the sons who are living outside the parental home and are not enrolled in school. Men in the follow-up observation are in their late 20s and early 30s.

Often mobility studies examine the status of fathers and their sons. For example, elasticities have been estimated for sons' earnings with respect to fathers' earnings (Hauser and Sewell 1975; Mazumder 2005; Solon 1992). In our period of analysis, from the mid-1960s to the mid-1990s, mothers' labor force participation, single-parenthood and assortative marriage all increased. Under these conditions, family circumstances provide a more complete description of social origins than father's status (Beller 2009). We include information on both parents, using mothers' and fathers' education as well as their combined income.

Sons' education at follow-up is measured by years of completed schooling. Because years of education is topcoded at 18 in the NLS66, we also topcode education at 18 years in the NLSY79. Robert Mare (1980) showed that linear regression estimates of the effect of family background on schooling were sensitive to changes in the distribution of educational attainment. Family background effects declined from 1962 to 1973 in the OCG surveys due to increased schooling. Mare proposed a logistic regression analysis of a series of dichotomous conditional transitions – entering college given high school graduation, for example. The problem Mare identified is acute when sons' educational distribution becomes top heavy. In our data, the lower tail of the education distribution thins but average schooling changes little and the percentage of college graduates actually declines from the older to the younger cohort. Consequently, we report linear regression estimates, as they allow us to retain all the information on years of completed schooling. These estimates also provide simple summaries of cohort and racial differences in mobility and easily connect the educational and income analyses.

We code parental education in five categories: missing (if a parent does not live with the child or does not report his education), less than high school (fewer than 12 years of schooling), high school (12 years), some college (13 to 15 years), or college or more (at least 16 years of education). The categorical measure captures the nonlinear relationship between parents' and sons' schooling. Alternate codings, including a continuous measure of parental education, provide substantively similar results. We include a category for missing parental education because black respondents report father's education at relatively low rates. The missing education category may reflect father absence rather than parental education. This is unlikely to be a confounding source of variation, however, as the percentage of absent fathers does not vary across the two NLS cohorts and the results are unchanged when the analysis is restricted to two-parent families with completely observed parental education.

Table 1 reports descriptive statistics for parents' and sons' educational attainment by cohort and race. Trends in educational attainment differ for parents and children. The NLS data show that parents' completed education increased across cohorts. However, like other research on educational attainment, we also find that the younger cohort of sons has no more schooling than the cohort born 15 years earlier. Among white men, the small decline in sons' average schooling results from the declining proportion of college graduates across cohorts. Our descriptive statistics are similar to those from the March Current Population Survey, which also show a relatively large share of college

Table 1: Descriptive Statistics for Parents' and Sons' Education, by NLS Cohort and Race

	Whites		Blacks	
	1966	1979	1966	1979
Son's Schooling				
Mean Years	13.91	13.31	12.37	12.43
SD Years	2.55	2.41	2.77	2.02
Less than high school (%)	8.45	11.16	27.62	17.44
BA or more (%)	35.04	25.98	15.12	10.61
Father's Schooling				
Mean Years	10.91	12.26	7.42	10.23
SD Years	3.36	3.24	3.84	3.33
Less than high school (%)	40.17	26.72	47.38	37.38
BA or more (%)	10.55	20.27	1.81	4.32
Missing (%)	13.59	6.45	41.33	27.22
Mother's Schooling				
Mean Years	11.18	11.98	8.41	10.94
SD Years	2.76	2.40	3.45	2.52
Less than high school (%)	34.11	23.42	64.72	46.02
BA or more (%)	9.15	11.48	2.22	7.05
Missing (%)	7.17	4.76	20.16	10.39
N	1715	2186	496	1319

graduates in the older cohort (see Appendix; Goldin and Katz 2008:249). Average years of schooling increased slightly for black men, mostly because of increasing schooling at the bottom of the distribution. In the older cohort, 28 percent of black men did not finish high school compared to 17 percent in the younger cohort.

Like our measures of sons' educational background, sons' economic background includes information on both parental householders. We create measures of family income that sum husbands' and wives' annual income from several sources, including wages and salary, farm and business income, and several government programs such as unemployment compensation. Incomes are transformed to constant dollars using the personal consumption expenditures index. Parents' income is averaged over the first three years of each survey. Son's income is also averaged over three years, 12 to 15 years later, at the conclusion of NLS66 survey and at the corresponding time in the NLSY79. Using three-year average incomes reduces measurement error and transitory variance that dampen parent-child income correlations. Estimates of the income elasticities are based on parents' and sons' log family incomes. A few respondents with non-positive incomes are dropped from the analysis.

We recode parental incomes to improve the comparability of the two surveys. In the NLS66, parental income is measured in 11 categories. Income is imputed at the mid-point of each category, except for the top open-ended category which, similar to Autor, Katz and Kearney (2008), is multiplied by 1.4. (Different top-codes did not affect our results.) Parental income is measured continuously in the NLS79. To make the NLSY79

Table 2: Descriptive Statistics for Parents' and Sons' Log Family Incomes, by NLS Cohort and Race

	Whites		Blacks	
	1966	1979	1966	1979
Son's Family Income				
Mean	10.678	10.548	10.261	10.060
SD	.563	.658	.786	.917
Parents' Family Income				
Mean	10.629	10.724	9.781	10.053
SD	.582	.585	.715	.697
N	1439	1412	437	728

Note: Incomes are measured in constant 2000 dollars.

data comparable to the NLS66, we recoded NLSY79 incomes into the same 11 categories, by quantile, as the NLS66. As in the NLS66, parental incomes in the NLSY79 were set to the mid-points of each income category, adjusted for inflation, then averaged over three years. Despite the recode, important differences remain. In the NLSY79, parents themselves reported their income. In the NLS66, the sons reported parental income during the first years of the survey. Because some fathers of the NLS66 sons were surveyed as part of the National Longitudinal Survey of Older Men 1966, it is possible to validate their sons' reports. Levine and Mazumder (2002) calculate a reliability ratio of .93 for the two income measures, suggesting measurement error will not contribute greatly to observed differences in mobility. Measurement error in parental income due to the discretizing and response error will tend to attenuate the estimated elasticities.

Descriptive statistics on incomes show strong generational differences, although mean incomes and income inequality for black and white parents vary little across cohorts (Table 2). Among sons, income inequality is clearly higher in the NLSY79 cohort than in the NLS66.

Our analysis aims to describe patterns in the association between sons' family backgrounds and their adult attainment. The mobility parameters are not causal estimates reflecting the effects of exogenous changes in parents' income or education on children's attainment. Instead, they describe the degree of socioeconomic resemblance across generations. Racial differences and cohort changes in these associations are the salient social facts of the evolving distribution of life chances. Although the analysis is motivated by the cross-cutting transformations of rising income inequality and Civil Rights, neither do we aim to estimate the causal effects of these transformations. Instead, rising inequality and institutional change provide the key historical contexts for interpreting our results.

Analysis

The analysis has three parts: 1. mobility from parents' education to son's education, 2. from parents' income to son's education, and 3. from parents' income to

son's income. Differences in the income and education variables require different analyses.

From Parents' Education to Son's Education

For family *i* we write son's years of schooling, e_{si}, as a function of the educational attainment of his father and his mother, $\mathbf{e}_{fi}$ and $\mathbf{e}_{mi}$. Parents' education is coded with four dummy variables: 1. less than high school education, 2. some college, 3. a four-year degree or more, or 4. missing. Parents who graduated high school and did not complete any college are in the reference category. Mothers' and fathers' educational attainments are both included, yielding a measure of educational origins consisting of eight dummy variables, $\mathbf{e}_{pi} = [\mathbf{e}_{fi}\ \mathbf{e}_{mi}]$.

For a given racial group in a given cohort, educational mobility is estimated with the regression,

$$\hat{e}_{si} = \gamma_0 + \mathbf{e}_{pi}'\gamma_p.$$

With this specification, mobility is quantified by the vector of regression coefficients, γ_p. A summary statistic for overall mobility is given by the Euclidean norm, which we call *I*, for inheritance,

$$I = \left(\gamma_p'\gamma_p\right)^{1/2}.$$

The inheritance statistic, *I*, is the square root of the sum of squared parental education coefficients. It is functionally related to a chi-square statistic for a test of the null hypothesis that the regression coefficients are jointly zero.[1] In the case that all coefficients equal zero, the inheritance statistic $I = 0$, indicating perfect mobility, where sons' education is unrelated to the educational attainment of their parents. When the regression coefficients are large, *I* will also be large, indicating substantial educational inheritance. The inheritance statistic allows simple comparisons of total educational mobility by race and cohort. Adding subscripts for race ($r = b$ or w) and cohort ($c = 66$ or 79), race-specific cohort trends are given by the difference, $\Delta_r = I_{79r} - I_{66r}$. Racial differences in mobility trends are given by $\Delta_w - \Delta_b$. We obtain standard errors for *I* by simulation, drawing regression coefficients from a multivariate normal distribution with means and covariance matrix at the least squares estimates. Simulations of the regression coefficients are then used to calculate simulated values of *I*. The standard error is estimated by the standard deviation of the simulation distribution for *I*. This approach might be viewed as a type of Bayesian posterior simulation (see Gelman et al. 2004).

Regressions for educational mobility are reported in Table 3. Across both cohorts and for both races, sons' educational attainment is positively associated with mothers'

and fathers' education. Generally positive coefficients for college-educated parents and negative coefficients for parents with less than high school education indicate that sons' schooling rises with parents'.

Table 3: Regression Analysis of Educational Mobility, Sons' Years of Schooling, by NLS Cohort and Race

	Whites			Blacks			Racial Difference
	1966	1979	Δ_w	1966	1979	Δ_b	$\Delta_w - \Delta_b$
Intercept	14.457	13.164	-1.294	15.056	12.779	-2.277	.984
	(.114)	(.079)	(.139)	(.486)	(.114)	(.499)	(.518)
Father's Schooling							
Missing	-.635	-.785	-.149	-1.530	-.258	1.272	-1.421
	(.199)	(.199)	(.281)	(.466)	(.152)	(.491)	(.566)
< HS	-.659	-.590	.069	-1.141	-.197	.944	-.875
	(.145)	(.122)	(.190)	(.452)	(.139)	(.473)	(.510)
Some college	.610	.737	.127	1.435	.435	-1.001	1.128
	(.233)	(.151)	(.278)	(.992)	(.265)	(1.027)	(1.064)
BA +	.765	1.520	.756	1.124	.958	-.166	.922
	(.219)	(.142)	(.261)	(1.135)	(.296)	(1.173)	(1.201)
Mother's Schooling							
Missing	-.822	-.998	-.116	-1.916	-1.254	.662	-.778
	(.243)	(.222)	(.329)	(.473)	(.198)	(.512)	(.609)
< HS	-1.171	-.860	.312	-1.845	-.534	1.311	-.999
	(.137)	(.121)	(.182)	(.405)	(.126)	(.424)	(.461)
Some college	.735	.699	-.036	-.275	.563	.837	-.874
	(.209)	(.152)	(.259)	(.852)	(.220)	(.880)	(.917)
BA +	1.008	1.156	.148	.950	1.503	.552	-.404
	(.244)	(.168)	(.296)	(.893)	(.283)	(.937)	(.982)
I	2.413	2.752	.340	4.398	2.447	-1.950	2.290
	(.148)	(.115)	(.187)	(.561)	(.192)	(.593)	(.622)
R^2	.185	.278	—	.171	.143	—	—
N	1715	2186	—	496	1319	—	—

Note: The inheritance statistic, I, is the Euclidian norm of the vector of regression coefficients excluding the intercept, defined in the text. Standard errors in parentheses.

Has educational mobility changed across cohorts? Educational inheritance remained stable for white men (Figure 1). Education coefficients for both mothers and fathers are nearly equal across the two cohorts. Our summary measure of the change in educational mobility – the difference in inheritance, $\Delta_w = I_{79w} - I_{66w}$ – is close to zero. The sons of college-educated fathers are the only exception to unchanging mobility among white men, as the relatively advantaged in the younger cohort obtained relatively more schooling than their counterparts in the older cohort.

In contrast to white mobility, black educational mobility increased significantly. Increased mobility resulted largely from the weakened association between fathers' and sons' education. The paternal education gradient flattened significantly from the older to the younger cohort. Indeed, there is no significant association in the younger

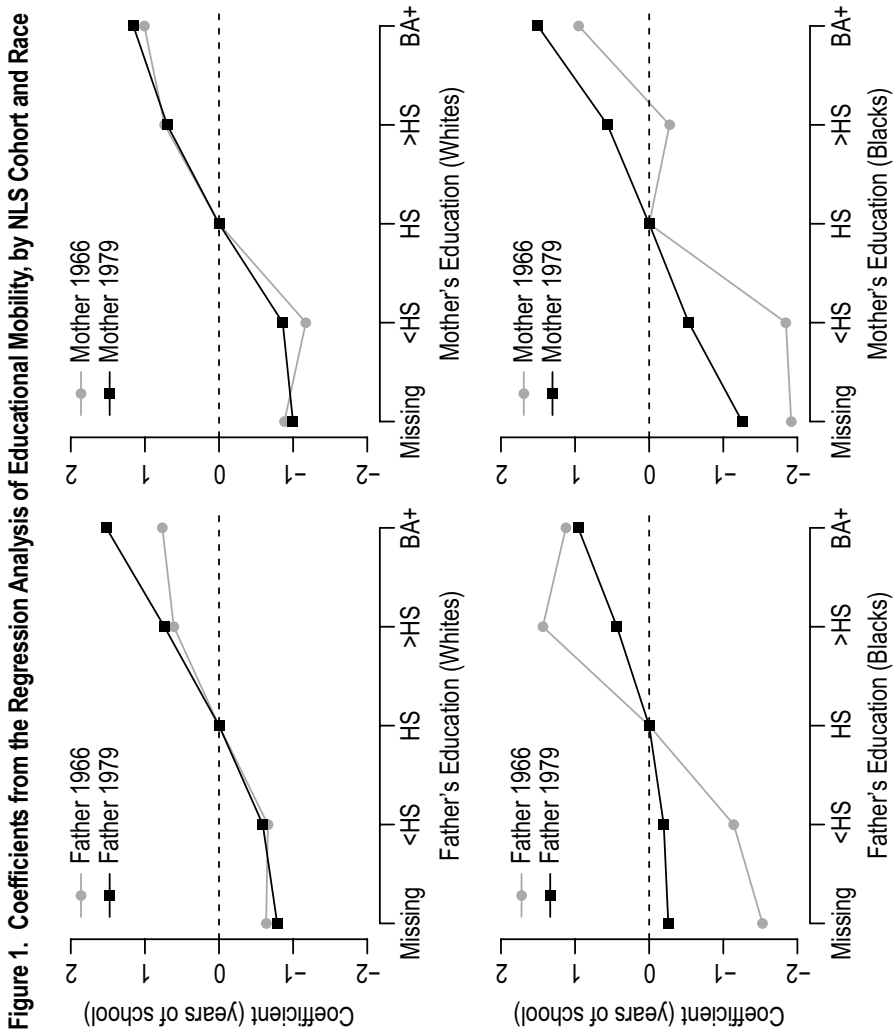

Figure 1. Coefficients from the Regression Analysis of Educational Mobility, by NLS Cohort and Race

cohort between respondents' and fathers' education at any level except for fathers with four-year degrees. The educational penalty associated with having a low-education mother (less than a high school degree) also declined across cohorts. The decline in educational inheritance is summarized by the fall in the inheritance statistic, from 4.4 to 2.4, a statistically significant difference (Table 3).

Table 4: Regression Analysis of Income-Education Mobility, by NLS Cohort and Race

	Whites			Blacks			Racial Difference
	1966	1979	Δ_w	1966	1979	Δ_b	$\Delta_w - \Delta_b$
Intercept	-1.541	-.046	1.495	2.241	6.110	3.870	-2.375
	(1.093)	(.965)	(1.458)	(1.674)	(.797)	(1.854)	(2.358)
Log Parental Income	1.464	1.230	-.234	1.040	.622	-.418	.183
	(.103)	(.090)	(.136)	(.170)	(.079)	(.188)	(.232)
R^2	.115	.098	—	.072	.052	—	—
N	1564	1729	—	478	1128	—	—

Note: Standard errors in parentheses.

From Parents' Income to Son's Education

To estimate mobility from parents' income to sons' educational attainment, we regress sons' years of schooling on parents' log income, y_{pi}, separately by race and cohort. The income-education equation is written:

$$\hat{e}_{si} = \alpha_0 + \alpha_p y_{pi}.$$

We see similar patterns in income-education mobility as we found for education-education mobility. Table 4 shows that for white men, the relationship between parental income and sons' education was unchanged across the two cohorts, with the parental income effect decreasing insignificantly. For black men, however, sons' schooling became significantly less stratified by parental income. The change in mobility results from the compression of the education distribution from the older to the younger cohort. The major shift took place at the bottom of the education distribution, as the high school dropout rate declined by almost 40 percent. Because there were no longer many black respondents with very low levels of education by the later cohort, the parental income gradient flattened. The rising educational mobility of black men is consistent with the hypothesis that Civil Rights reforms raised educational attainment and thereby reduced the association between family background and schooling. In particular, we find that children from low-income and low-education families substantially

Table 5: Regression Analysis of Income Mobility, by NLS Cohort and Race

	Whites			Blacks			Racial Difference
	1966	1979	Δ_w	1966	1979	Δ_b	$\Delta_w - \Delta_b$
Intercept	7.657	3.559	-4.098	5.668	3.489	-2.180	-1.919
	(1.023)	(1.244)	(1.610)	(2.573)	(2.412)	(3.527)	(3.877)
Log Parental Income	.203	.299	.096	.152	.315	.163	-.067
	(.025)	(.029)	(.038)	(.053)	(.048)	(.071)	(.081)
Son's age (A)	.054	.415	.361	.364	.391	.026	.335
	(.116)	(.141)	(.182)	(.296)	(.275)	(.404)	(.443)
A^2	-.000	-.011	-.011	-.011	-.011	-.001	-.010
	(.003)	(.004)	(.005)	(.009)	(.008)	(.012)	(.013)
R^2	.085	.089	—	.023	.061	—	—
N	1439	1412	—	437	728	—	—

Note: Standard errors in parentheses.

increased their chances of high school graduation by the 1980s.

From Parents' Income to Son's Income

To model income mobility, we follow recent studies by regressing sons' log income on log parental income. For a given cohort and race, the log family income of the son in family *i*, y_{si}, is written as a linear function of his parents' log income, y_{pi},

$$\hat{y}_{si} = \beta_0 + \beta_p y_{pi} + \beta_{a1} A_i + \beta_{a2} A_i^2,$$

where we also account for life cycle effects by adjusting quadratically for son's age, A_i. The adjustment for son's age is motivated by findings that estimates of permanent incomes are sensitive to the age at which they are measured (Haider and Solon 2006). Given the small range of ages over which sons are observed, the results are insensitive to this adjustment. We omit controls for father's age because of missing data for black respondents, although exploratory analysis shows that adjustment for father's age makes little difference to the results.

Interest centers on the income elasticity, β_p, which quantifies the average persistence of parental income across generations. An elasticity of .5 implies that a 10 percent difference in two families' incomes is associated, approximately, with a 5 percent difference in their sons' incomes. The coefficient β_p describes average income inheritance for a particular race

and cohort. As before, $\Delta_r = \beta_{p,79r} - \beta_{p,66r}$ represents cohort change in mobility for sons of race r ($r = w$ or b) and $\Delta_w - \Delta_b$ summarizes racial difference in mobility trends.

Our estimates indicate that intergenerational income mobility decreased across cohorts for black and white men (Table 5). The income elasticities rose from about .2 to .3. These elasticities are lower than other recent estimates; this may reflect the categorical measurement of parental incomes in the NLS. Still, the estimates are similar to those from Levine and Mazumder's (2002) analysis of the same data. Although the level of estimated inheritance is low in both cohorts, the rise across cohorts is large and significant. Consider two white families separated by a standard deviation on the income distribution, about .6 log points. In the older cohort, the income gap between the sons associated with their family backgrounds is about 12 percent. The gap grows to 18 percent in the younger cohort. Racial differences in income mobility trends also contrast with the trends in educational mobility. Unlike the education trends, changes in income mobility were similar across races. Black income inheritance rose more than white, nearly doubling from .15 to .31. As a result, black and white men shared nearly equal levels of income mobility in the younger cohort.

It is important to recognize, however, that equal mobility is not the same as equal opportunity. In fact, equal mobility may indicate widely divergent opportunities. The average income of black parents is substantially lower than that of white parents. Consequently, if black children's mobility equals white children's mobility, then black children regress to a lower mean than white children, even though they regress at the same rate. Equal mobility simply means that the relationship between parents' and children's economic outcomes is similar across races. It does not indicate that children's outcomes are similar across races (even given their parental background). Examining mobility trends allows us to understand the changing role of individual family background in children's life chances. Examining trends in opportunity is far more complex, but would certainly require studying not only the role of family background but also average outcomes irrespective of family background (focusing on the intercept as well as the slope, speaking from a regression perspective).

Reconciling Educational and Income Mobility

Our analysis suggests that educational mobility increased for black men, was unchanged for white men, and that income mobility declined for both groups. How can we reconcile these findings? A decomposition shows that the income elasticity depends 1. partly on the relationship between parents' and sons' incomes independent of sons' education, and 2. partly on a component reflecting both sons' educational mobility and their economic returns to education. For a given race and cohort, we can decompose the income elasticity, β_p, into these two components,

$$\beta_p = \beta_{p|e} + \varepsilon.$$

The first component, $\beta_{p|e}$, is "pure income inheritance," the coefficient from a regression of sons' log income on parents' log income controlling for sons' education.

The second component, ε, is "mediated income inheritance," the "effect" of parental income through sons' education. Mediated income inheritance is the product,

$$\varepsilon = \alpha_p \cdot \beta_{e|p},$$

where α_p represents income-educational mobility (the slope from a regression of sons' education on parents' log income) and $\beta_{e|p}$ is the economic return to education (the slope from a regression of sons' log income on sons' education controlling for parents' income). The decomposition shows that income inheritance can increase even if educational inheritance declines. Income inheritance, β_p, will increase when educational inheritance, α_p, declines if the decline is offset by an increase in income returns to education, $\beta_{e|p}$, or by an increase in pure income inheritance, $\beta_{p|e}$.

Pure income inheritance can be factored as

$$\beta_{p|e} = \rho_{p|e} \cdot \sigma_{s|e} / \sigma_{p|e},$$

where $\rho_{p|e}$ is the partial correlation between parents' and sons' incomes, controlling for sons' education, and $\sigma_{s|e}$ and $\sigma_{p|e}$ are the education-adjusted standard deviations of sons' and parents' income distributions. In general, a period of rising inequality will be reflected in an increase in the income dispersion ratio, $\sigma_{s|e}/\sigma_{p|e}$. In this event, pure income inheritance may increase even if the income correlation, $\rho_{p|e}$, remains unchanged. In short, income mobility may decrease even as educational mobility increases, particularly when income inequality is rising.

The decomposition of an elasticity – a regression coefficient – into a term for the correlation and a term for the ratio of standard deviations is not uncommon in studies of income mobility (e.g., Björkland and Jäntti 2009). The decomposition is useful because it formalizes the contribution of increasing inequality to declining mobility. It may be countered that the correlation, not the elasticity, provides a better measure of mobility precisely because it is insensitive to changes in distribution. We view changes in the income distribution as relevant to understanding the inheritance of economic advantage. From this perspective, mobility describes, in part, a distance traveled from origin to destination. The utility of the current decomposition resides in reporting all three pieces of information – the elasticity, the correlation and the ratio of income distributions. We also take the additional step of controlling for education, relating the process of educational mobility to income mobility.

The decomposition for white men shows that about a third of the rise in income elasticity is related to sons' education and two-thirds is due to income effects other than those mediated by sons' education (Table 6). The income-education analysis shows that white men's education mobility did not change significantly across the two periods. Almost all of the education-mediated effect of income is driven by increasing economic returns to education. The returns to education nearly double for white men, increasing from .044 in the older cohort to .079 in the younger cohort. The results are

Table 6: Decomposition of Changes in Income Mobility across NLS Cohorts, by Race

	1966	1979	Δ	Δ%
Whites				
Decomposing β_p				
Income elasticity, β_p	.203	.299	.096	100
Pure income inheritance, $\beta_{p\|e}$	.142	.203	.062	64
Mediated income inheritance, ε	.061	.096	.035	36
Decomposing $\beta_{p\|e}$				
$\rho_{p\|e}$	.145	.183	—	—
$\sigma_{s\|e}/\sigma_{p\|e}$	.979	1.111	—	—
Decomposing ε				
α_p	1.394	1.220	—	—
$\beta_{e\|p}$	.044	.079	—	—
Blacks				
Decomposing β_p				
Income elasticity, β_p	.152	.315	.163	100
Pure income inheritance, $\beta_{p\|e}$	.042	.220	.178	109
Mediated income inheritance, ε	.110	.095	-.015	-9
Decomposing $\beta_{p\|e}$				
$\rho_{p\|e}$	.039	.174	—	—
$\sigma_{s\|e}/\sigma_{p\|e}$	1.090	1.263	—	—
Decomposing ε				
α_p	1.089	.623	—	—
$\beta_{e\|p}$	.101	.153	—	—

Note: All parameters are based on regressions that adjust for son's age and age squared. See text for the definitions of the decomposition parameters.

somewhat different for black men. Rising economic returns to schooling are almost exactly offset by the increased educational mobility of black men. The larger increase in the intergenerational reproduction of black incomes results from growth in pure income inheritance, which rises from .042 to .220, accounting for more than the total increase in the income elasticity.

For both black and white men, the rise in the pure income inheritance, $\beta_{p|e}$, stems only partly from rising income inequality. Correlations between parents' and sons' education-adjusted incomes also increased. The contribution of the rising correlation is especially large for black men. The four-fold increase in the black income correlation accounts for about 80 percent of the large increase in pure income inheritance. For white men, the increasing income correlation accounts for about 65 percent of the increase in pure income inheritance. Rising elasticities were driven not solely by rising inequality but also by increasing correspondence between parents' and sons' incomes, net of sons' years of schooling.

Discussion and Conclusions

The comparison of mobility in two NLS cohorts reveals two distinct patterns. First, we find declining income mobility across the cohorts for black and white men. This

finding of declining income mobility in the period of rising inequality is consistent with other analyses by Aaronson and Mazumder (2008) and Levine and Mazumder (2002). These studies, like ours, indicate that the era of rising inequality coincided with the increasing reproduction of income inequality.

Second, trends in educational mobility vary across racial lines. Among white men, there is little change in either the education-education or income-education relationship. Among black men, there is clear evidence of increased educational mobility. Mobility increased because very low levels of schooling among older generations had largely disappeared by the time of the younger NLS cohort sons. Increased educational mobility thus appears largely due to the expansion of educational opportunities, and the accessibility of high school in particular, for black students growing up in the 1970s and 1980s in the wake of the Civil Rights movement.

Taken together, trends in income and educational mobility present a puzzle. How did income inheritance increase when educational inheritance was either unchanging (for white men) or declining (for black men)? Though educational mobility increased, significantly so for black men, the effect was almost exactly offset by increasing returns to education. Given these offsetting effects, the increase in the income elasticity was driven by an increase in pure income inheritance, independent of education effects.

The increase in pure income inheritance might be interpreted in several ways. A strong causal interpretation suggests the partial income correlation captures the relationship between parent's economic status and son's family incomes independent of the influence of the school. These economic ties between parents and children can be placed in the context of rising inequality. Although educational attainment is intimately connected with the rise in U.S. inequality, an alternative account emphasizes institutional change in the American labor market. Declining unionization, declines in male job tenure, increased subcontracting and casual employment indicate a de-institutionalization of the American labor market (Farber 2007; Massey 2008; Western and Rosenfeld 2011). We speculate that under these conditions, the income advantages of inherited wealth, inter vivos transfers, cultural capital and social connections, independent of education, may have increased. While these benefits of social background are seldom included in studies of earnings and family income inequality, they are plausible drivers of incomes at a time when collective wage setting by unions, internal labor markets and minimum wage levels eroded.

The causal interpretation of the relationship between parental status and children's incomes would be strongly supported if a son's highest grade completed captured all the influence of schooling on incomes. However, it is likely that higher parental incomes are associated with higher quality schooling in the form of better schools, superior academic achievement or greater cognitive ability at a given grade level. In this case, the partial correlation in incomes, net of highest grade completed, is not fully purged of the influence of the schooling. Our analysis would reflect these confounding effects if the correlation between parental income and the unobserved quality of schooling changed across cohorts. To move past the correlational perspective in future research, a richer definition of social origins is required, including for example, measures of the quality of schooling and family social and cultural capital.

Although our descriptive framework makes it difficult to sharply distinguish the effects of social background from schooling, the key social facts of changing mobility in our analysis are clear. Economic mobility declined among NLS respondents as income inequality increased. Educational mobility generally increased, and increased substantially for black men as opportunities for high school graduation and college attendance became institutionalized. Increased educational mobility did not yield greater income mobility, however, because incomes became more stratified by schooling. Mobility studies often find a correlation between the economic status of parents and children, even controlling for children's education. In our analysis, this partial correlation between parents' and children's incomes grows substantially for white and black men, and accounts for much of the decline in economic mobility from the 1970s to the 1990s.

Notes

1. Under the null hypothesis that the regression coefficients are jointly zero, the chi-square statistic is $\gamma_p' V^{-1} \gamma_p$, where V is the covariance matrix for the least squares estimates.

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Appendix

Table A.1: Percentage Distribution of Sons' Education: NLS and CPS Comparison, by Cohort and Race

	Whites		Blacks	
	NLS	CPS	NLS	CPS
1966 Cohort, Ages 29-36 in 1981				
< HS	8.45	10.53	27.62	25.06
HS or Some College	56.50	57.11	57.26	63.15
BA +	35.04	32.37	15.12	11.78
N	1715	8411	496	782
1979 Cohort, Ages 29-36 in 1994				
< HS	11.16	9.38	17.44	16.80
HS or Some College	62.85	62.77	71.95	70.82
BA +	25.98	27.86	10.61	13.07
N	2186	6984	1319	734